Northern California's Computer Magazine

July 14, 1998 • #181

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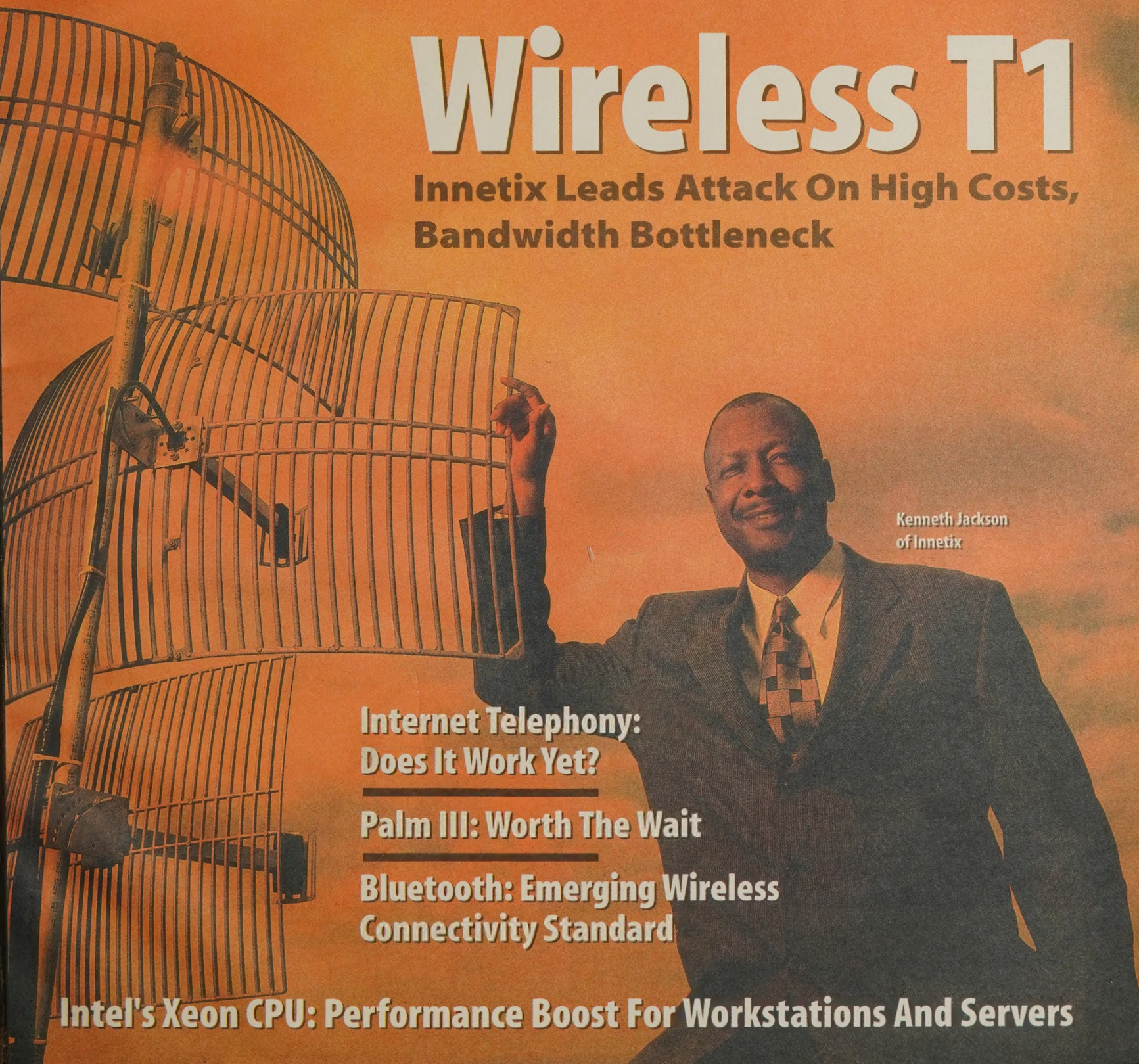

Wireless T1

Innetix Leads Attack On High Costs, Bandwidth Bottleneck

Kenneth Jackson of Innetix

Internet Telephony: Does It Work Yet?

Palm III: Worth The Wait

Bluetooth: Emerging Wireless Connectivity Standard

Intel's Xeon CPU: Performance Boost For Workstations And Servers

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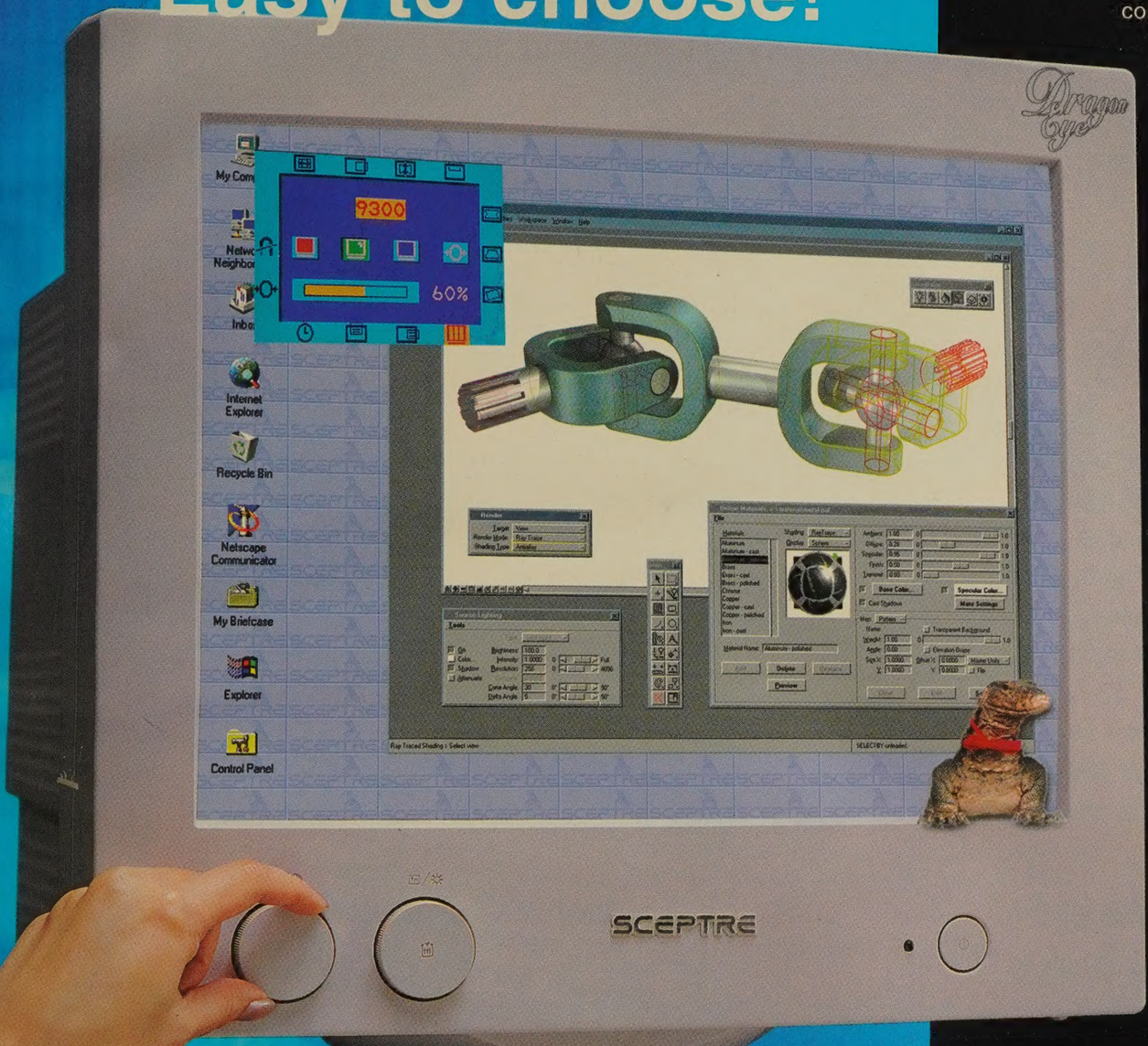

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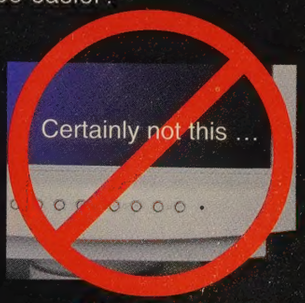
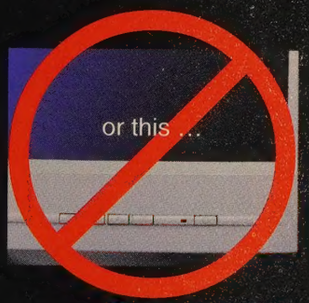
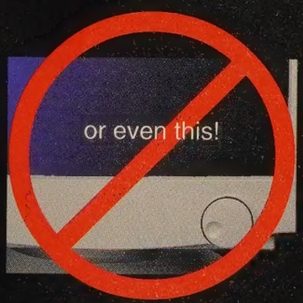


Old-style technology
Too many buttons
Not user friendly



Same story here
as above



Overly simplified
More difficult to use
More prone to error

D97A

19-inch (18-inch viewable) CRT flat square monitor with AR/ASC
.22mm (horizontal) dot pitch—1600 x 1200 resolution @ 75 Hz.
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May 1998
Computer Buyer Editor's Choice
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BYTE MAGAZINE
APRIL 1998

Users Choice Award
for Keyboards goes hands down to
Ortek Technologies
(their U.S. branch is called KBtek America)
for their MCK-142 Pro.

The MCK-142 has the heft and feel and keyclick of the old Northgate OmniKey. It has function keys across the top and on the side as well. Above the keyboard are 24 keys you can program to do almost anything, including address and signature, and opening programs with parameters; essentially, and text string you like at the touch of a button.

The MCK-142 feels good and is as solid as a rock. It doesn't have the "Windows" key, but then that's nothing more than control-escape anyway. My Northgate OmniKey keyboards are old, and several have broken down. Now I don't worry about that so much. If you liked the Northgate OmniKey, you will like the Ortek MCK-142.

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Microsoft® Windows®98

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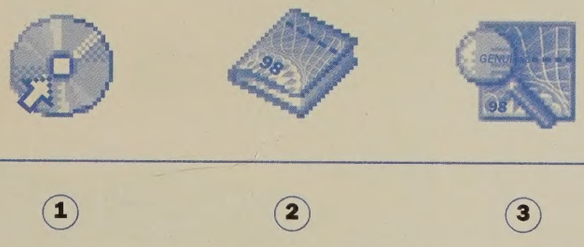
Every copy of the Microsoft® Windows® 98 operating system distributed through the OEM channel includes three revolutionary new security features that instantly tell you it's legal. Now you'll know for sure—and you won't risk your good name and your business by unknowingly trading in illegal software.



① ② ③

Three new security features with the Microsoft Windows 98 operating system (OEM version) clearly spell out what's legal:

1. CD Hologram
A special 3-D hologram on the hub of every Windows 98 CD is your visual guarantee of legal product. The word "Genuine" appears as you tilt the CD in the light.

2. NEW Certificate of Authenticity (COA)
The all-new COA is now the actual cover of the product manual. It contains the special heat-sensitive strip, a watermark, and a new, high-security design. If it's not integrated, it's illegal.

3. Heat-Sensitive Strip
An ingenious heat-sensitive security strip is now featured across the top of each product manual. When rubbed, it reveals the word "Genuine."

We're committed to a fair and level playing field.
By introducing unique new features and by vigorously prosecuting software pirates, Microsoft is demonstrating its commitment to a fair and level playing field for system builders. We are also telling end-users about the perils of software piracy and what documentation they should expect to see when they buy a new computer.

Here's how to enjoy peace of mind and be 100% sure it's legal.
First, always look for the three new security features that come with Microsoft Windows 98. Second, work with an Authorized Microsoft OEM Product Distributor. If you come across something you suspect is illegal—call ***1-800-RU-LEGIT*** or your local Microsoft office.

The answer to staying legal is at your fingertips.
You can come out ahead in other ways, too. By becoming an active member of the Microsoft OEM System Builder program, you can reap a number of additional benefits from staying legal.

For more details on how you can participate in the Microsoft OEM System Builder Program visit ***www.microsoft.com/oem/*** or call ***1-800-325-1233***.

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Microsoft® OEM **System Builder** Program www.microsoft.com/oem/

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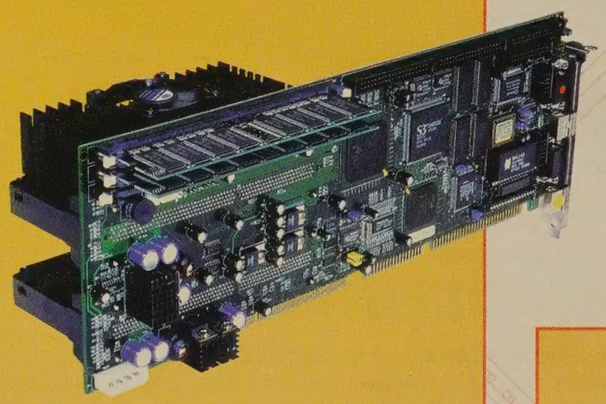

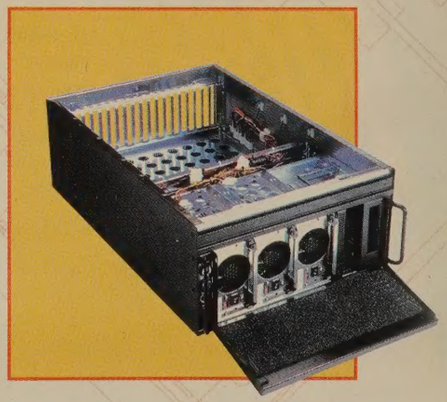

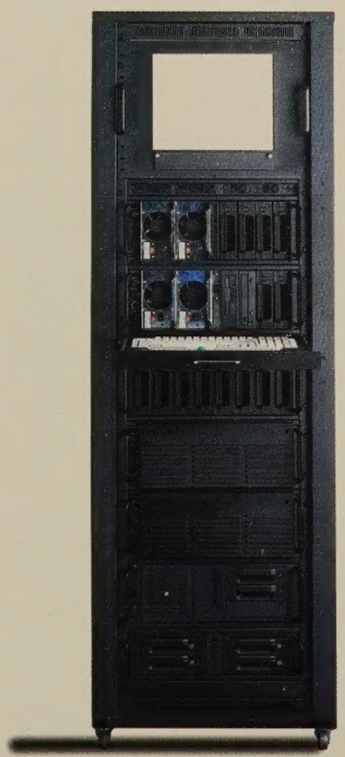

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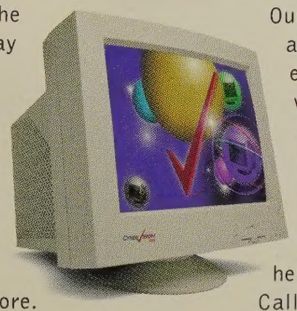

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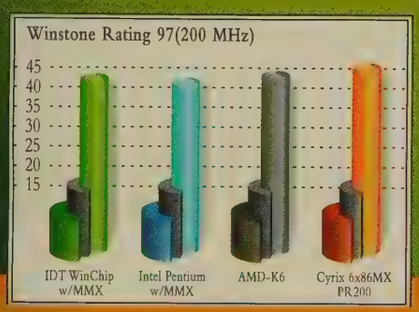
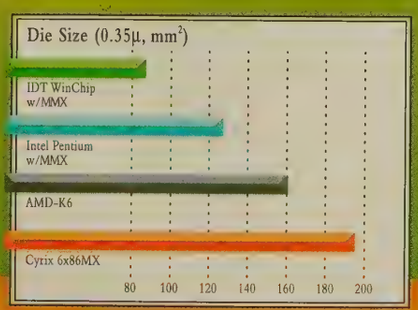


For Windows business applications, IDT WinChip offers comparable performance to Intel Pentium® with MMX™ Technology, AMD-K6® and Cyrix 6x86MX™.



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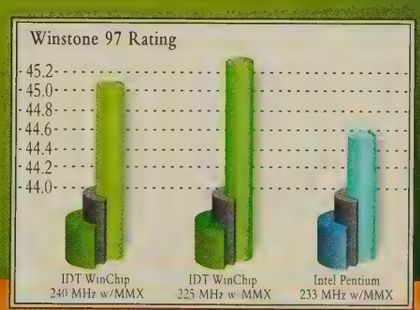

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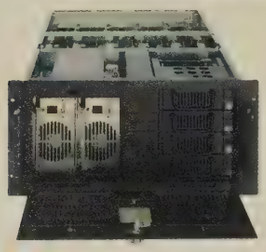
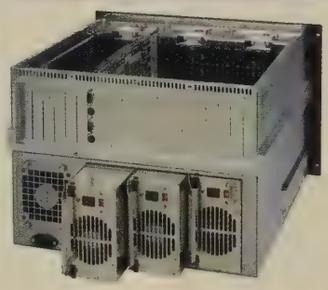


- 8-20 slots PCI/ISA BP support
- Split BP (Up to 4 Systems) support
- AT or ATX motherboard support
- Individual shock mounts for up to eight 5.25" devices
- Open 3.5" drive bay - not shock mounted
- Front panel support for 4 individual systems
- Air filters on all intake vents
- Front panel mounted activity & alarm LED's
- Steel and aluminum construction
- Hot swap fans & power supplies
- Fault Resilient Features: Temperature Remote Monitoring, Hot Swap Fans, PS & HDD
- 19"(W) x 8.75"(H) x 26"(D)

Rock Solid Fault Resilient Protection

Computer TELEPHONY 1997 PRODUCT OF THE YEAR

7000HTR CT/Network Server



- 8 to 20 slot PCI/ISA backplane support
- Split backplane support (up to 4 systems)
- AT or ATX motherboard support
- Individual shock mounts for 8 drives
- Fault resilient features: Temperature Remote Monitoring hot swap fans, three 300W hot swap PS & HDD
- 19"(W) x 12.25"(H) x 18.5"(D)

Three Hot Swap Power Supplies

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- Eight 5.25" drive bays†
- Dual hot swap PS-400W(AC) or 300W(DC)*
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- Supports RAID level 0, 1, 3 & 5
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* Optional
† 8 drive bays with single power supplies.
7 drive bays with hot swap power supplies

RAID

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- **OS Compatibility:** Windows NT/95, OS/2 Warp, SCO UNIX, Netware & DOS

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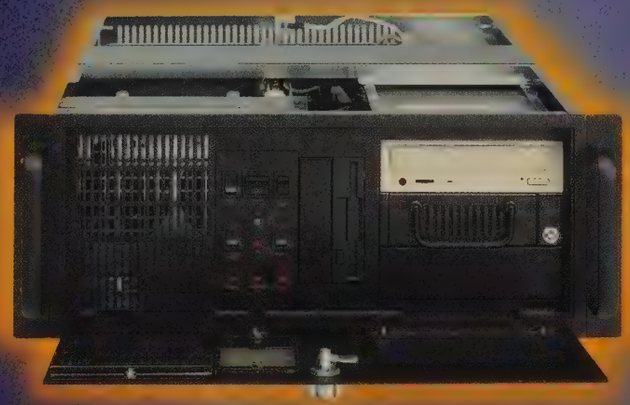

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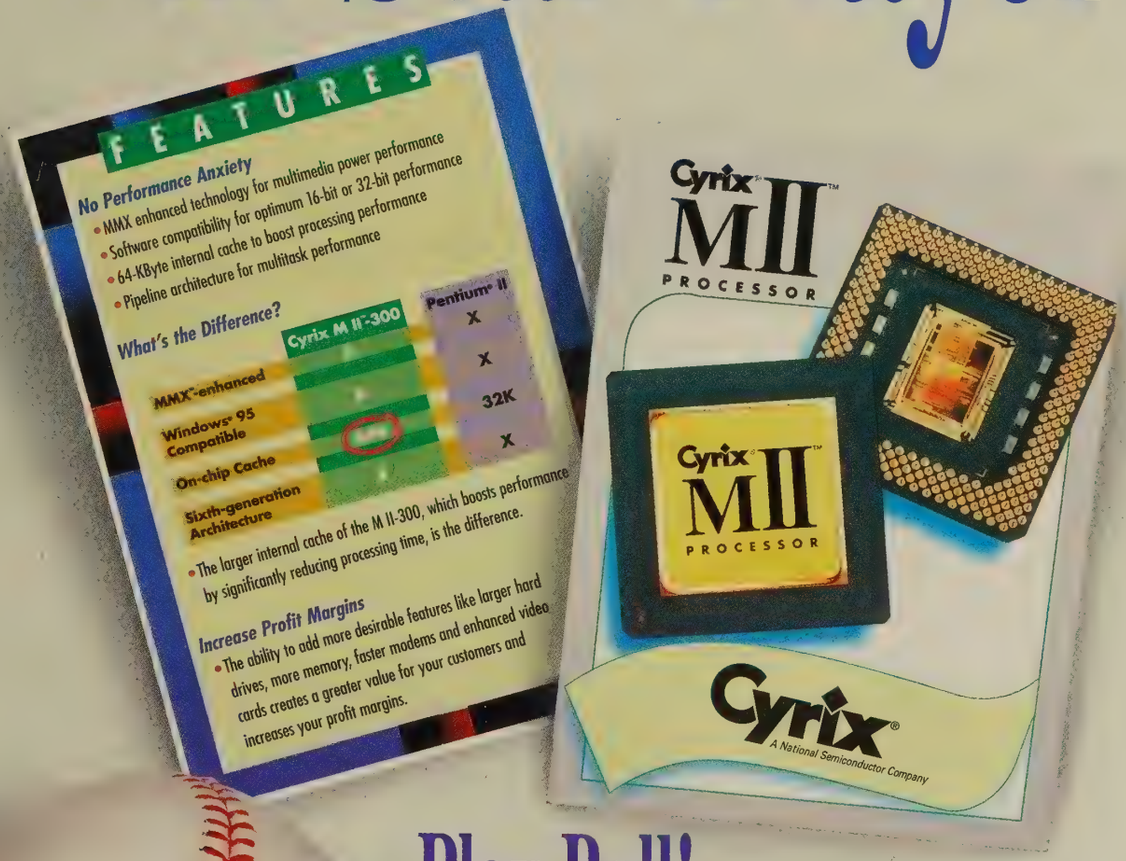
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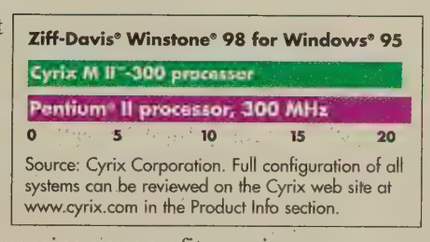

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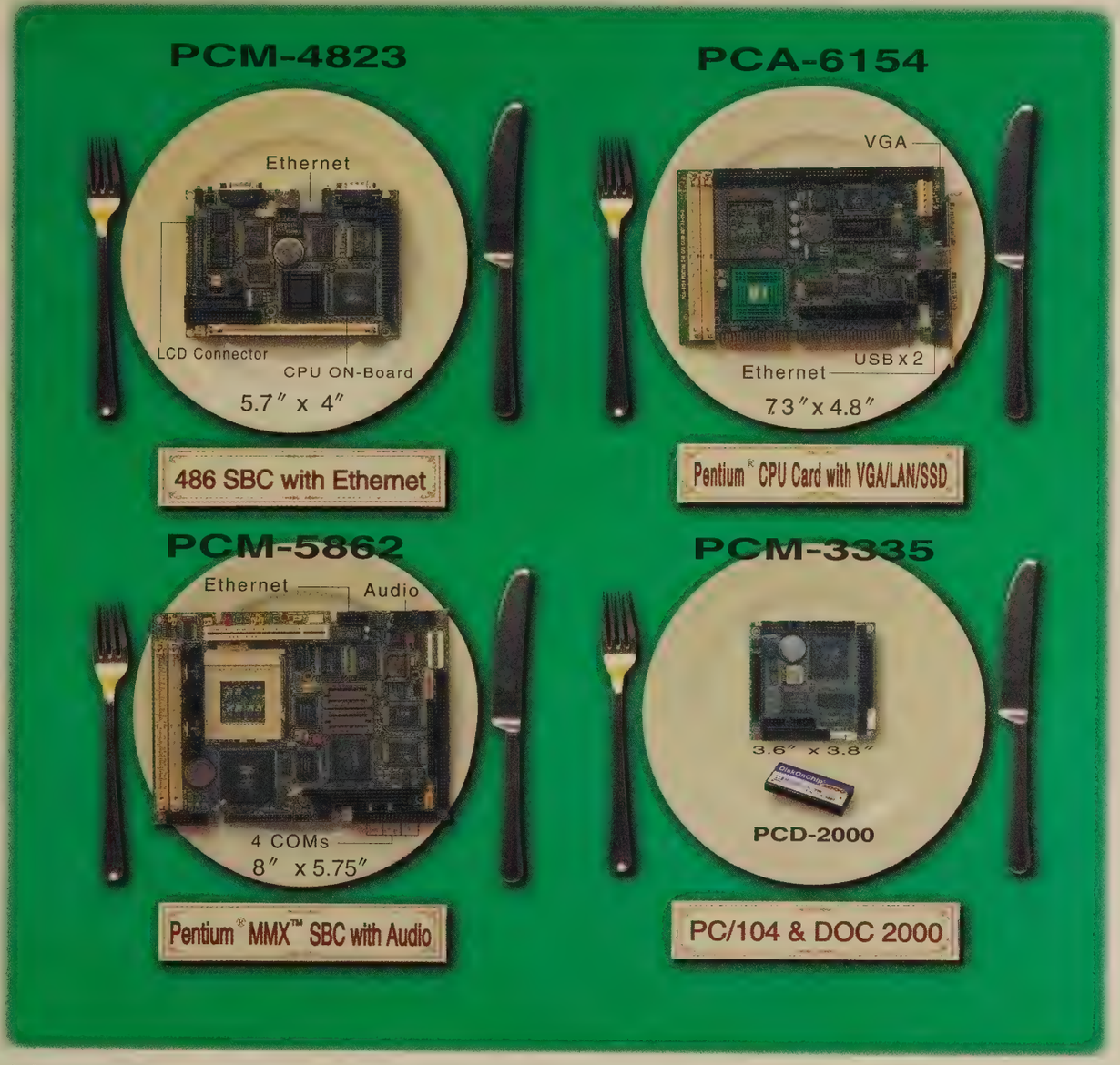

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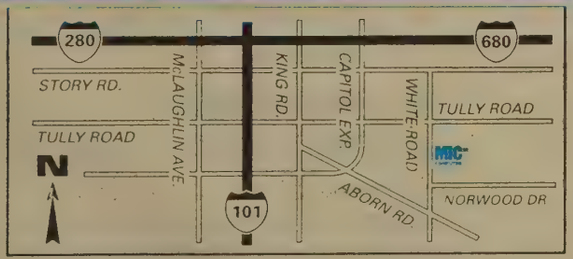

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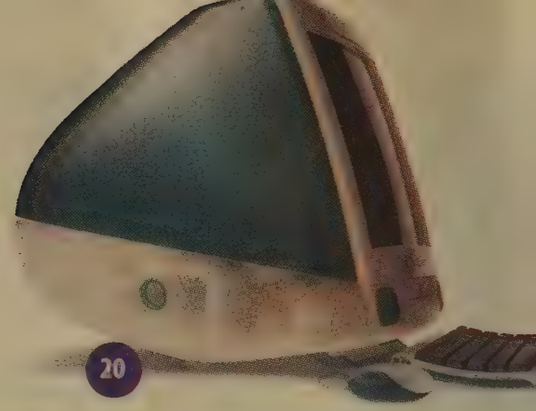

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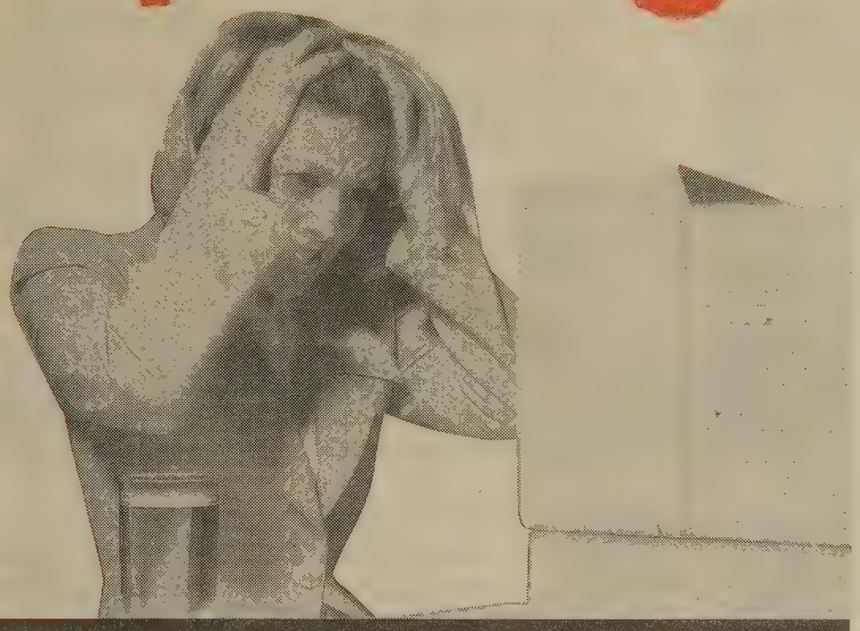

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MICROTIMES
July 14, 1998 • Issue #181

Contributors

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Paul Hoffman

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Sam Penrose is a longtime BMUG volunteer and the author of BMUG's "Which Mac Should I Buy?", a practical guide to selecting your next Mac.

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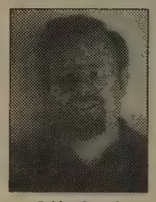
Jim Warren (*jwarren@well.com*) organized the First Conference on Computers, Freedom & Privacy (1991), and led the 1993 citizen effort putting state legislation and statutes on the Internet. He served on the 1995 state Secretary of State's Electronic Filings Advisory Panel seeking online campaign finance disclosures and on the state Senate's Task Force on Electronic Access to Public Records until resigning in protest in June, 1997.

Warren is one of the named plaintiffs in the constitutional challenge against the Communications Decency Act, that was overturned in June, 1997, by the U.S. Supreme Court.

He founded InfoWorld, was founding host of PBS' *Computer Chronicles*, founding editor of *Dr. Dobb's Journal* and served half a decade on the Board of Directors of Autodesk, Inc.

He has received the Hugh M. Hefner First Amendment Award (1994), James Madison Freedom-of-Information Award from the Society of Professional Journalists—Northern California (1994), the Electronic Frontier Foundation Pioneer Award (1992, its first year) and the John Dvorak Lifetime Achievement Award (1995).

Douglas J. Nakakihara


Fabian Pascal

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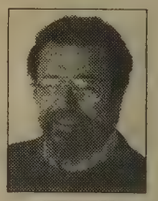
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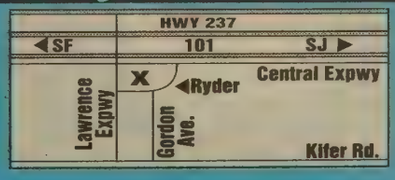

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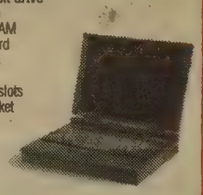

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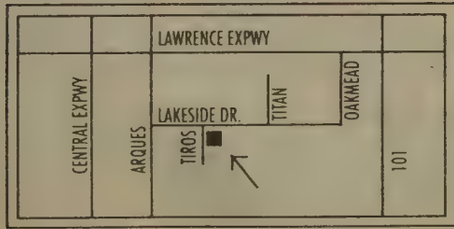

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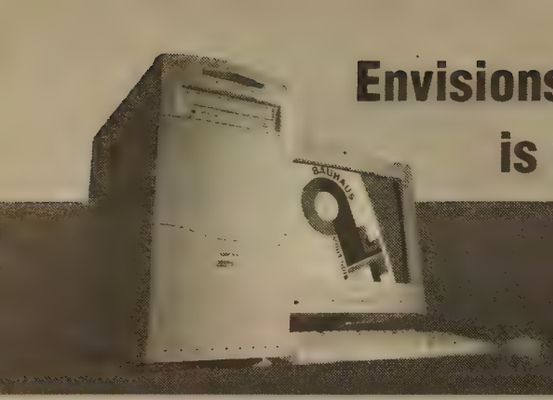

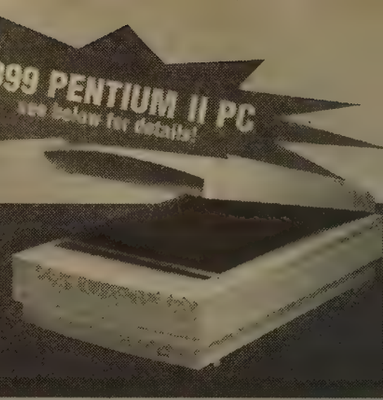

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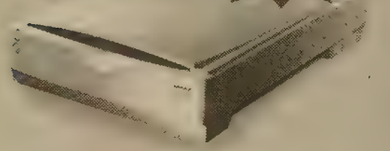

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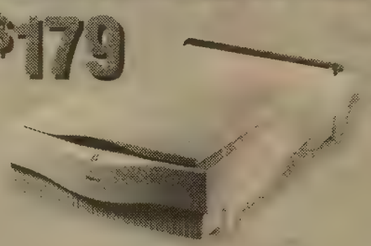

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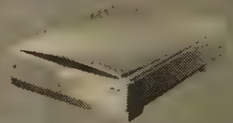

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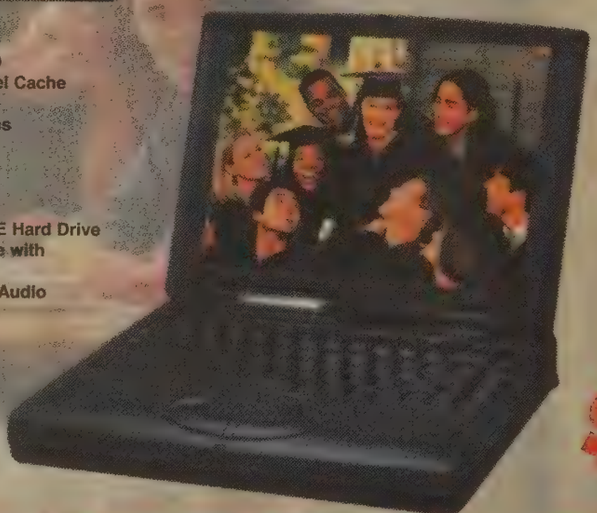

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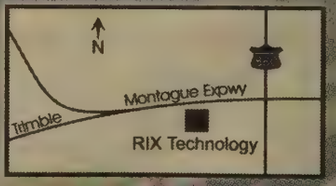

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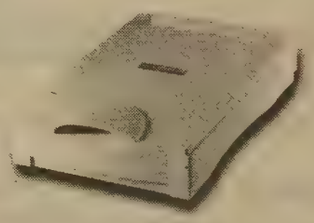

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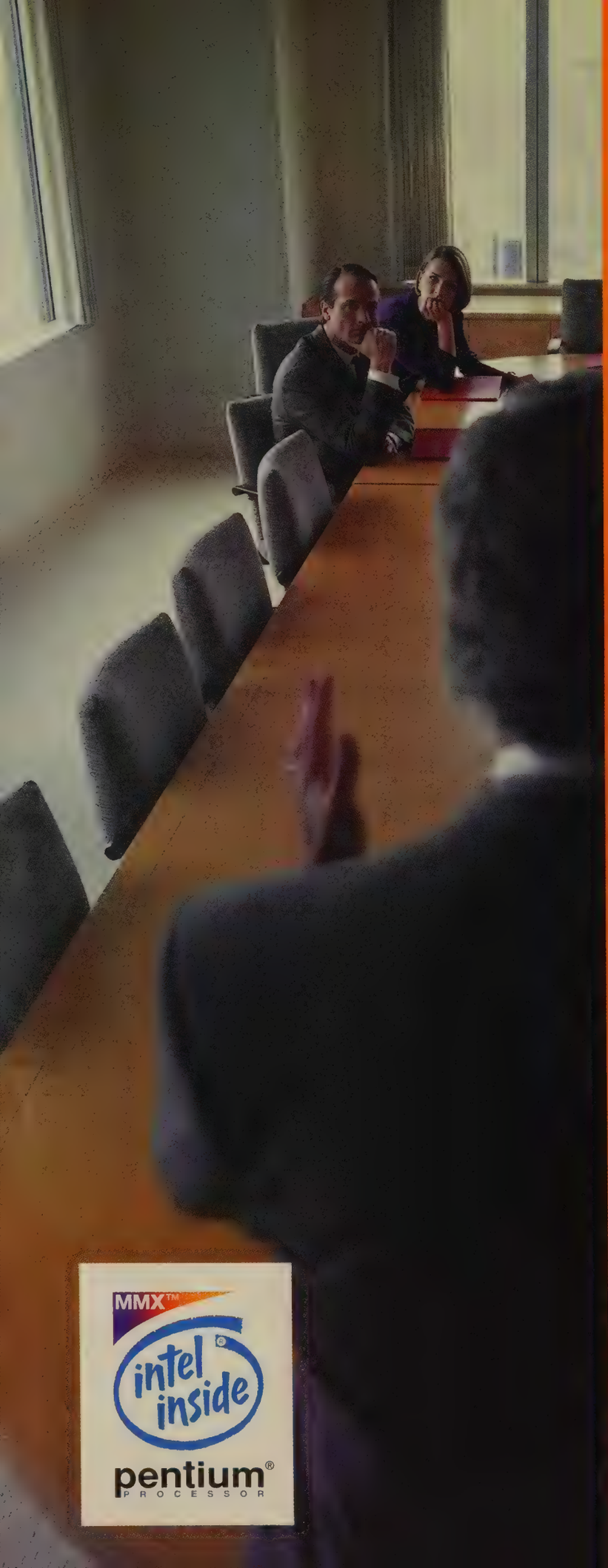

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- 2.0 GB Hard Drive
- 24X Speed IDE CD-ROM Drive
- 2MB PCI Video Card
- 33.6 Fax Modem
- PCI Sound Card with 3D
- Power Speakers (AM105)
- 104 Key Keyboard (WIN 95)
- Serial Mouse 2 Button
- Microsoft Windows 98
- Monitor Sold Separately

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#XPMT181

Intel® Pentium® Processor w/MMX Technology 233MHz - $595
Intel® Pentium® Processor w/MMX Technology 200MHz - $585

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CYBEREXPRESS 2 JUNIOR

- Intel® Celeron™ Processor - 266MHz
- Med Tower Case with Power Supply
- Supermicro LX440 Chipset Main Board
- Cooling Fan
- 32MB SDRAM/DIMM
- 1.44MB Floppy Drive
- 2.0GB IDE Hard Disk Drive
- 24X-Speed IDE CD-ROM
- Diamond 56K Fax Modem
- Diamond PCI Sound Card
- Powered Speakers
- 104 Key/PSe Keyboard
- Mouse PS2 (2-Button)
- Microsoft Windows 98
- Monitor Sold Separately

$849

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Intel® Celeron™ Processor- 300MHz-$899

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- 32X-Speed IDE CD-ROM
- Diamond Stealth AGP 4MB Video Card
- Diamond 56K Fax Modem
- Diamond PCI Sound Card
- Powered Speakers
- 104 Key/PS2 Keyboard
- Microsoft PS2 Mouse
- Microsoft Windows 98
- Monitor Sold Separately

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#CX2MT181

Intel® PENTIUM® II Processor 333MHz - $1325
Intel® PENTIUM® II Processor 300MHz - $1210
Intel® PENTIUM® II Processor 266MHz - $1055
Intel® Celeron™ Processor 300MHz - $999
Intel® Celeron™ Processor 266MHz - $949

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- Intel® PENTIUM® II Processor - 400MHz
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- 4.3GB IDE Hard Disk Drive
- 32X-Speed IDE CD-ROM
- Diamond Stealth AGP 4MB Video Card
- Diamond Supermax 56K Fax Modem
- Diamond PCI Sound Card
- Powered Speakers
- 104 Key/ PS2 Keyboard
- Microsoft Intellipoint PS2 Mouse
- Microsoft Windows 98
- Monitor Sold Separately

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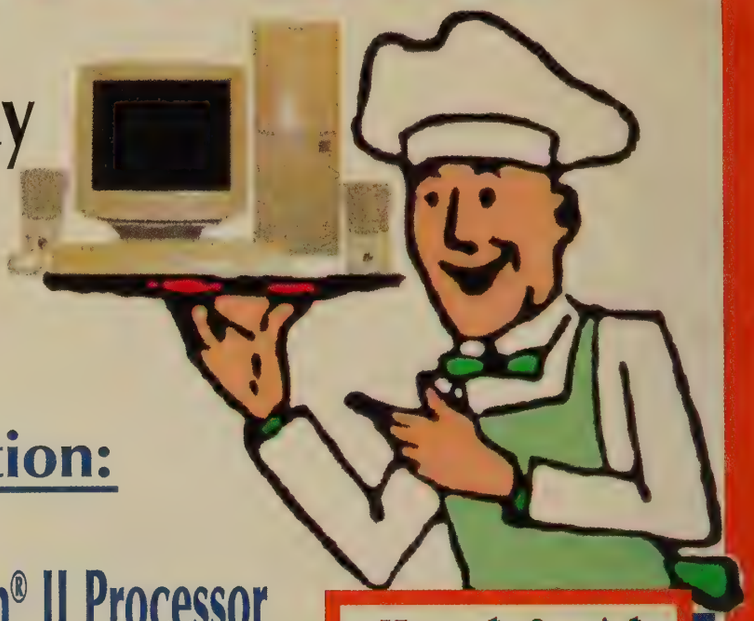

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- Finding the best "recipe" - Configuration
- Searching for the finest "ingredients" - Components
- Cooking the best "disk" - Integration

Cyber Restaurant Configuration:

- 100MHz Bus 440BX Mainboard
- 4MB AGP Graphics Accelerator
- PCI Sound Card
- 56K Supermax PCI Modem
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- 4.3GB Hard Disk
- Intellipoint PS/2 Mouse
- Keytronics 104-Key Keyboard
- Powered Speakers
- MS Windows 95 (CD) Installed
- 64MB PC100 SDRAM
- 1.44 Floppy Drive
- Windows 95 w/Windows 98 Upgrade Coupon

Intel® Pentium® II Processor 400MHz $1795

Intel® Pentium® II Processor 350MHz .. $1595
Intel® Pentium® II Processor 333MHz .. $1385
Intel® Pentium® II Processor 300MHz .. $1265
Intel® Pentium® II Processor 266MHz .. $1110
Intel® Pentium® II Processor 233MHz .. $1050

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SCSI Re-Writable SONY CD-RW
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4.8X MAX, 32X CD-ROM
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Ingredients:

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Diamond Stealth	Acer	Microsoft
Diamond Multimedia	Quantum	Keytronics

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ATX Mid Tow Case
USR 56K Internal Fax/Modem
Microsoft NaturlKeyboard
Microsoft IntelliMouse
Altec Lancing ACS45 w/S.W. Speaker
Panasonic S70 17" Monitor
MS Windows 95
MS Office 97/SBE

HiQ Saturn II Desktop
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Matrox Productiva 4MB AGP Video
Fujitsu 3.2GB EIDE HDD
24X Internal EIDE CDROM
ATX Mid Tow Case
USR 56K Internal Fax/Modem
104 Keytronic ATX Keyboard
Microsoft IntelliMouse
180 Watt Speaker w/AC Adapter
Panasonic P15 15" Monitor
MS Windows 95
MS Office 97/SBE

HiQ Valueline PC
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Intel TX Chipset MB
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Fujitsu 3.2GB EIDE HDD
24X Internal EIDE CDROM
HiQ YAMAHA SB 16 Sound Card
AT Mid Tow Case
USR 56K Internal Fax/Modem
104 Keytronic AT Keyboard
Microsoft IntelliMouse
60 Watt Speaker w/AC Adapter
Cybervision C50 15" Monitor
MS Windows 95

HiQ SMP II Server
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ASUS P2L97-DS MB
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Diamond 3D Pro 2400 4MB Video
Dual Fujitsu 4GB UW SCSI HDD
32X Internal SCSI CDROM
ATX Full Tow Case
Intel 8465 PCI 10/100 NIC
USR 56K Internal Fax/Modem
104 Keytronic ATX Keyboard
Microsoft IntelliMouse
Cybervision C40 14" Monitor
MS NT Server 4.0

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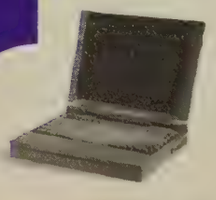

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Affordable Pentium-II/300 Performance

64MB, 5.1GB, Stealth II G460, BX chipset, .25dp Monitor **$1,479**

STANDARD SYSTEM CONFIGURATION

- ASUS P2B BX Chipset Motherboard
- Intel Pentium-II/300MHz(512K) CPU
- 64MB SDRAM (single), 100MHz w/SPD
- 5.1GB Quantum Fireball EL UDMA/33
- Diamond Stealth II G460 8MB 2X AGP
- Toshiba 32X IDE CD-ROM Drive
- Diamond 56K VoiceFaxModem PCI V.90
- Teac 1.44MB Floppy Drive
- Creative Labs Ensoniq AudioPCI
- 17" (16"v) Decaview V385 Monitor (.25dp, 1600x1200 max resolution)
- Altec Lansing ACS43 Speakers
- Mitsumi PS/2 Mouse
- Mitsumi PS/2 Keyboard
- Microsoft Windows 95/98/NT
- In-Win A500 ATX MidTower Case

POPULAR UPGRADE PACKAGES

Premium [+$310]
- 7.6GB Quantum Fireball EL UDMA/33
- 128MB SDRAM DIMM
- Creative Labs SoundBlaster PCI 64
- Cambridge Soundworks "PCWorks"
- Iomega 100MB ZIP Drive w/Tools Disk

DVD w/Surround Sound [+$280]
- Creative Labs PC-DVD Encore Dxr2 Kit
- Altec Lansing ADA305 Surround Sound Speakers w/USB Support

Speed [+$310]
- Intel P2/350MHz CPU (100MHz Bus)
- 128MB SDRAM DIMM

Space [+$235]
- 10.2GB Quantum Fireball EL UDMA/33
- Iomega 100MB ZIP Drive w/Tools Disk

Basic DVD [+$60]
- Pioneer 2nd gen DVD-ROM
- ATI XPERT 98 w/SOFT-DVD

OTHER UPGRADE OPTIONS

56K/V.90 MODEMS
- Diamond SupraMax PCI 56iSP [+$15]
- USRobotics 5685 ISA Voice/SP [+$55]

QUANTUM HARD DRIVES
- 2.5GB UDMA/33 [-$40]
- 7.6GB UDMA/33 [+$75]
- 10.2GB UDMA/33 [+$150]

AGP VIDEO CARDS
- ATI XPERT 98 8MB [+$0]
- ATI XPERT@PLAY 98 8MB [+$30]
- FireGL/Leadtek 2300 8MB [+$80]
- All-In-Wonder PRO 8MB [+$160]
- Matrox G100 8MB [+$0]
- Matrox G200 8/16MB [+$N/A]

MEMORY
- 128MB SDRAM (single) [+$80]

MONITORS
- 17" (16"v) Decaview GA387 [+$115] (Trinitron, .25dp, 1600x1200@75Hz)
- 19" (18"v) Decaview V/G400 [+$240] (.26dp, 1600x1200@75Hz)

BACKUP/CDR DRIVES
- Iomega 100MB ZIP w/Tools [+$85]
- Mitsumi CDR 2x8 IDE [+$250]

SPEAKERS
- ACS45/PCWorks W/Sub [+$35]
- ACS48/SoundWorks W/Sub [+$100]
- ACS ADA305 W/Surround [+$125]

SOUND CARDS
- Creative Labs SB PCI 64 [+$60]
- Creative SB AWE 64 GOLD [+$100]

VOODOO 2
- Monster 3D-2 8/12MB [+$220/275]

OFFICE SUITES / BUNDLES
- MS Office 97 Std/Pro [+$125/170]
- MS Home Essentials 98 [+$75]

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- P2B, 4xPCI/3xISA/1xAGP/2xUSB/3xDIMM
- P2B-S, 4xPCI/2xISA/1xAGP/2xUSB/4xDIMM + Adaptec U2W-SCSI Ctrl. [7890+3860!]
- P2B-LS, same as P2B-S + Intel Ether Express Pro 10/100B-T [82558]
- P2B-DS, same as P2B-S + Dual CPU Support

TYAN [5 PCI SLOTS]
- TYAN Tsunami 1846SL, 5xPCI/2xISA/1xAGP/2xUSB/3xDIMM

ABIT [SOFTMENU, 4 DIMM SOCKETS]
- ABIT BX6, 4xPCI/3xISA/1xAGP/2xUSB/4xDIMM

The bottom line is: Unless you really need the 5th PCI slot or the 4th DIMM socket, go ASUS! Otherwise, ABIT is OK if you want the 4th DIMM scoket, and TYAN is fine if you need the 5th PCI slot. When it comes to SCSI, ASUS is way ahead of the competition. Tyan and Supermicro just don't stack up. Don't be fooled by the feature listings - the important thing is whether the board works with all the high-end parts, and that it continues to work for as long as you own the system!

ON-LINE CUSTOM CONFIGURATOR

The configurator is now working! Any system, using ALL the parts we carry, can be priced out (always with the *current, daily* pricing). You have complete specifications for all the products - our own recommendations, as well as the manufacturers specs. Also, look for incredible specials and prizes only available at HTTP://WWW.LJSYSTEMS.COM

Pentium-II/350 Premium Performance

128MB, USR 56K/V.90, 7.6GB, SB PCI 64, .25dp Monitor **$1,999**

STANDARD SYSTEM CONFIGURATION

- ASUS P2B BX Chipset Motherboard
- Intel Pentium-II/350MHz(512K) CPU
- 128MB SDRAM (single), 100MHz w/SPD
- 7.6GB Quantum Fireball EL UDMA/33
- ATI XPERT 98 8MB 2X AGP
- Toshiba 32X IDE CD-ROM Drive
- USRobotics 56K X2/V.90 VoiceFaxModem
- Teac 1.44MB Floppy Drive
- Creative Labs SoundBlaster PCI 64
- 17" (16"v) Decaview V385 Monitor (.25dp, 1600x1200 max resolution)
- ACS45/PCWorks Speakers w/Subwoof
- Microsoft PS/2 IntelliMouse
- Keytronic PS/2 Keyboard
- Microsoft Windows 95/98/NT
- In-Win A500 ATX MidTower Case

POPULAR UPGRADE PACKAGES

DVD w/Surround Sound [+$245]
- Creative Labs PC-DVD Encore Dxr2 Kit
- Altec Lansing ADA305 Surround Sound Speakers w/USB Support

Premium [+$595]
- Intel P2/400MHz CPU
- 10.2GB Quantum Fireball EL UDMA/33
- Diamond Monster 3D-2 8MB Retail
- Iomega 100MB ZIP Drive w/Tools Disk

CAD Station [+$450]
- Intel P2/400MHz CPU
- 256MB SDRAM DIMM
- Leadtek 2300 Permedia 2 8MB AGP

Gamer's Choice [+$375]
- Diamond Monster 3D-2 12MB Retail
- Altec Lansing ADA305 Surround Sound Speakers w/USB Support

OTHER UPGRADE OPTIONS (MORE AVAILABLE!)

VOODOO 2
- Monster 3D-2 8/12MB [+$220/275]

OFFICE SUITES / BUNDLES
- MS Office 97 Std/Pro [+$125/170]
- MS Home Essentials 98 [+$75]

AGP VIDEO CARDS
- Diamond Stealth II G460 8MB [+$0]
- ATI XPERT@PLAY 98 8MB [+$30]
- FireGL/Leadtek 2300 8MB [+$80]
- All-In-Wonder PRO 8MB [+$160]
- Matrox G100 8MB [+$0]
- Matrox G200 8/16MB [+$N/A]

MEMORY
- 256MB SDRAM, 100MHz [+$155]

MONITORS
- 17" (16"v) Decaview GA387 [+$115] (Trinitron, .25dp, 1600x1200@75Hz)
- 19" (18"v) Decaview V/G400 [+$240] (.26dp, 1600x1200@75Hz)
- 19"(18"v) Hitachi 751/52 [+$495/545] (.22dp, 1600x1200@75/80Hz)
- 19"(18"v) SONY 400PS [+$695] (Trinitron, .25dp, 1600x1200@75Hz)

BACKUP/CDR DRIVES
- Mitsumi CDR 2x8 IDE (+$250)

SPEAKERS
- ACS ADA305 W/Surround (+$90)

SOUND CARDS
- Creative SB AWE 64 GOLD (+$40)

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- ASUS P2B-S Motherboard w/U2W-SCSI
- Intel Pentium-II/400MHz MMX CPU
- 128MB SDRAM, 100MHz w/SPD
- 4.5GB Quantum Ultra-2-Wide SCSI
- ATI XPERT 98 8MB 2X AGP
- 32X NEC/TEAC/Toshiba SCSI CD-ROM
- Diamond 56K VoiceFaxModem PCI
- Teac 1.44MB Floppy Drive
- Creative Labs SoundBlaster PCI 64
- 17" (16"v) Decaview V385 Monitor (.25dp, 1600x1200 max resolution)
- ACS45/PCWorks Speakers W/Subwoofer
- Microsoft IntelliMouse PS/2
- Keytronic KT2000 PS/2 Keyboard
- Microsoft Windows 95/98/NT
- In-Win A500 ATX MidTower Case

POPULAR UPGRADE PACKAGES

DVD w/Surround Sound [+$220]
- Creative Labs PC-DVD Encore Dxr2 Kit
- Altec Lansing ADA305 Surround Sound Speakers w/USB Support

Gamer's Choice [+$635]
- 2 x Diamond Monster 3D-2 12MB
- Altec Lansing ADA305 Surround Sound Speakers w/USB Support

Premium [+$810]
- 9.1GB Quantum U2W-SCSI
- Diamond Monster 3D-2 8MB Retail
- Iomega 100MB ZIP SCSI w/Tools Disk
- 19" Decaview .26dp V/G400 Monitor

Power CAD Station [+$2,600]
- ASUS P2B-DS Motherboard
- 2 x Intel P2/400MHz CPU
- 256MB SDRAM DIMM
- Leadtek 2530 AGP Video Card

OTHER UPGRADE OPTIONS (MORE AVAILABLE!)

VOODOO 2
- Monster 3D-2 8/12MB [+$220/275]

OFFICE SUITES / BUNDLES
- MS Office 97 Std/Pro [+$125/170]
- MS Home Essentials 98 [+$75]

U2W-SCSI HARD DRIVES
- 9.1GB Quantum, 7200rpm [+$250]
- 9.1GB Seagate [+$650]

MOTHERBOARDS
- ASUS P2B-DS, Dual [+$150]

SPEAKERS
- ACS ADA305 W/Surround [+$125]

AGP VIDEO CARDS
- FireGL/Leadtek 2300 8MB [+$80]
- All-In-Wonder PRO 8MB [+$160]
- Matrox G200 8/16MB [+$N/A]
- ELSA Gloria Synergy 8MB [+$115]
- Leadtek 2530 AGP [+$1,495]

MEMORY
- 256MB SDRAM, 100MHz [+$155]

MONITORS
- 17" (16"v) Decaview GA387 [+$115] (Trinitron, .25dp, 1600x1200@75Hz)
- 19" (18"v) Decaview V/G400 [+$240] (.26dp, 1600x1200@75Hz)
- 19"(18"v) Hitachi 751/52 [+$495/545] (.22dp, 1600x1200@75/80Hz)
- 21"(20"v) Viewsonic P815 (+$990) (.25dp, 1800x1440@76Hz)
- 21"(20"v) Sony 500PS (+1090) (Trinitron, .25dp, 1800x1440@76Hz)

BACKUP/CDR DRIVES
- Iomega 100MB ZIP (+$100)
- Iomega 1GB Jaz (+$265)
- Panasonic 4x8 CD-R (+$325)
- Yamaha 2x4x6 CD-RW (+$460)

PCI NETWORK CARDS
- Intel EtherPro 10/100TP (+$55)
- 3COM 3C905 10/100TP (+$65)
- 3COM 3C900 10/100Combo (+$75)

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HOW WE CONFIGURE OUR SYSTEMS

#1 Quality/Compatibility

#2 Performance

#3 Value

MOTHERBOARDS

Go for the 100MHz Front Side Bus if you can afford it. The performance difference to the original 66MHz bus is **significant**! Please see the comments on the previous page about the different models (with basic specs). ASUS is our #1 motherboard choice - they have outstanding quality and compatibility. Whenever we have a problem with a Tyan, Abit, SuperMicro or an Intel motherboard, we can solve it by using ASUS instead. ASUS is now standard on all our systems.

CPU

We only carry Intel Pentium-II CPUs. From 233MHz to 333MHz, the Front Side Bus (CPU/Memory) is 66MHz. For the 350, 400 and the upcoming 450MHz CPUs, the FSB is 100MHz. Both level 1 and level 2 cache is built into the Pentium-II package, and the L2 cache is 512K, running at half the internal CPU speed (i.e. 200MHz for the 400MHz CPU). In late June/early July, Intel should have announced the next generation, slot 2 CPU called *Xeon*. This chip will have L2 cache running at CPU speed, as well as options for larger L2 cache sizes. Intel is aiming these chips at the high-end workstation/server market, and we expect them to be priced accordingly. Check with us regarding availability and price.

MEMORY

We always use major brand name, 100MHz (or better), SDRAM DIMM memory with EEPROM for Serial Presence Detect (SPD) BIOS configuration. SPD means that the motherboard BIOS can download exact configuration data about that particular DIMM to ensure reliable operation. Our systems include only one DIMM for 64 and 128MB system memory configurations to allow for greater expandability. A word of advice - you can never have too much memory. 32MB is the absolute minimum. Go for 128MB of memory (or more!) if you can afford it, and at least 64MB; you'll notice the difference!

HARD DRIVES & SCSI vs. IDE

We prefer Quantum hard disk drives because of the reliability, but we also use Western Digital and Maxtor Ultra-DMA/33 and Seagate Ultra-2-Wide SCSI drives if the customer requests it. The new Quantum Fireball EL Ultra-DMA/33 drives have 162MBits/s internal transfer rate and a 512kB cache. We expect them to be available in quantities by the time you read this ad. Ultra-2-Wide is now standard in our SCSI systems. With built-in Adaptec U2W controller on the ASUS P2B-S/LS/DS motherboards, we have a cost-effective solution offering extreme desktop performance. We use the Quantum Viking-II and Atlas-III models, with 512kB and 1MB cache respectively, available in 4.5, 9.1 and 18.2GB. To further reduce the latency and track-to-track seek time, which is important if you frequently work with a lot of files, we recommend the Seagate Cheetah II 10,000rpm drives. U2W drives transfer data at up to 80MB/s, compared to 40MB/s for regular Ultra-Wide SCSI. Besides higher transfer rates, faster rotational speeds and lower seek times, SCSI has many other features that improve performance over IDE drives. We recommend SCSI for the NT operating system in particular, but any power-user would benefit from having a SCSI controller take the load off the CPU. The performance difference between SCSI and IDE is significant - and contrary to common belief, having a SCSI system does *not* require you to be a computer geek to make it work. Increased expandability (up to 15 devices - IDE only 4) is a plus. Highly recommended.

VIDEO CARDS

We carry a full line of ATI and DIAMOND video cards, as well as certain models from Matrox and Number 9. Matrox' new Millennium G200 should be available shortly, in both 8MB and 16MB version, as well as the 8MB version of the Diamond Viper. If you do graphics development, CAD, 3DStudioMax, etc. we recommend a card that does 100% hardware openGL (Diamond FireGL 1000 Pro, Leadtek 2300 or the high-end Leadtek 2500/2530). The ATI XPERT 98 series offers good 2D and 3D performance, combined with high refresh rates and DVD decoding. The new Intel 740 chipset gives you excellent speed at a low price, but the current offerings only support 256 colors in 1600x1200 resolution. If you want top 3D game performance add the Diamond Monster 3D 2, available in both 8MB and 12MB versions.

MONITORS

We list only a small portion of the available selection - what we think gives you the best value and features. Choosing a monitor is mostly personal preference, and we can provide you with pretty much any model from Viewsonic, Optiquest, Sony, Hitachi, NEC, MAG, Princeton, Nokia, Eizo-Nanao, CTX, ADI and DecaView.

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P-233 MMX	$710

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MS Mouse
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TX97X Intel 430TX	$111
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GA-686BX Intel 440BX 550MHz	$145
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Diamond Fire GL 4MB PCI	$115
Millennium II 4MB PCI/AGP	$121

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SoundBlaster 16Bit	$33
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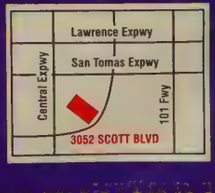

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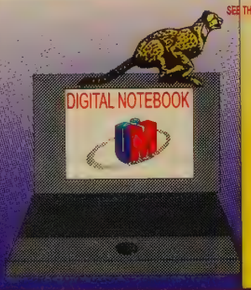

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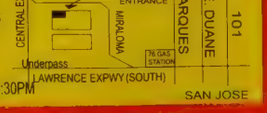

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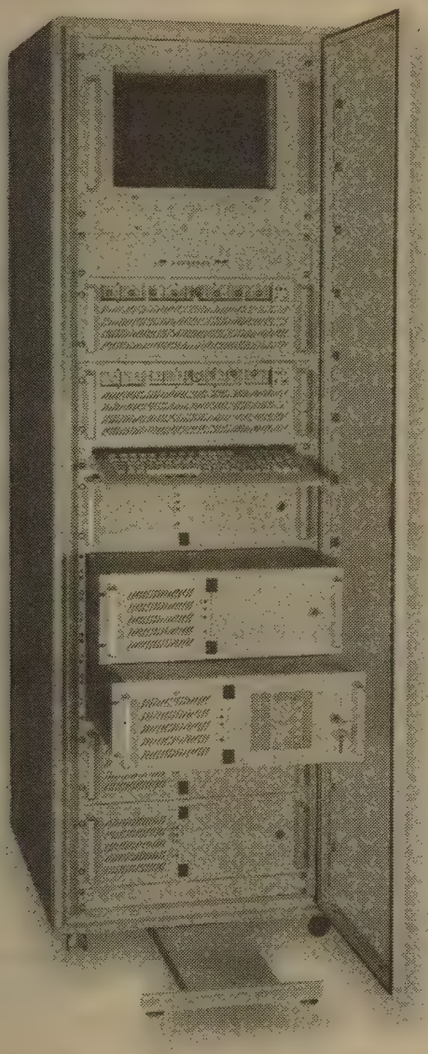

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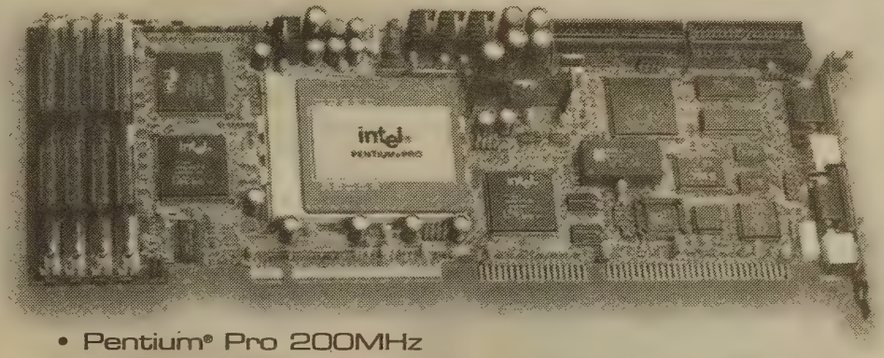

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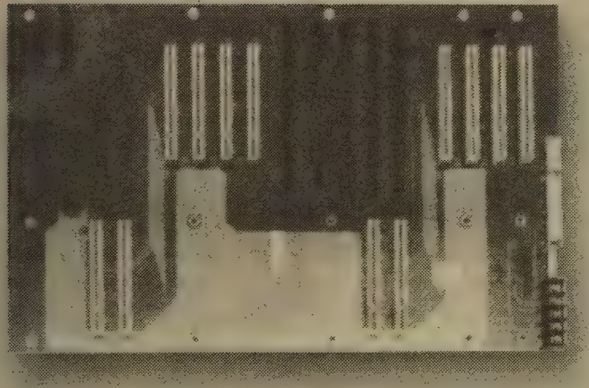

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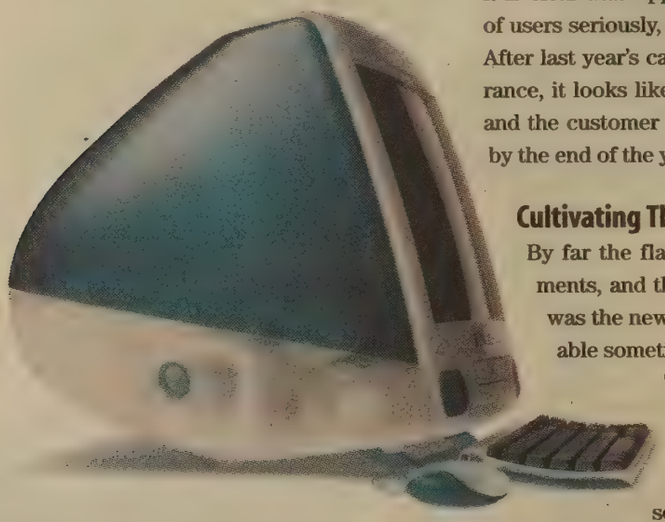
New Hope For Apple

It's Finally Listening To Its Markets

By Paul Hoffman

After last year's campaign of arrogance and ignorance, it looks like the "old Apple" may be back, and the customer is on top. We'll certainly know by the end of the year.



The non-stop talk about Department of Justice antitrust lawsuits has drowned out one of the more interesting recent stories—namely that the whole world doesn't revolve around Microsoft and Intel.

In the last few weeks, Apple made three major announcements that have turned heads and given many people the feeling that Apple isn't on the way out. Even ex-supporters who gave up on Apple last year are now feeling like the company may regain its position in the personal computer world.

The three announcements were for new laptops, a new low-end desktop system, and a new roadmap for the Mac OS. Taking all this together, it is clear that Apple has taken the mass exodus of users seriously, and has gone back to its roots. After last year's campaign of arrogance and ignorance, it looks like the "old Apple" may be back, and the customer is on top. We'll certainly know by the end of the year.

Cultivating The Wow Factor

By far the flashiest of the three announcements, and the one that got the most press, was the new iMac system that will be available sometime in August.

The $1300 system includes a built-in monitor, and will compete well with many of the low-end PC systems being sold. Apple went all-out on making the design intriguing and fun. The entire case is translucent, letting you peer into the guts of the computer whenever you feel like it. It's not like there's much to see in there, but many entry-level buyers do in fact find that looking inside the computer reduces the mystery.

The second part of the design that caught many people by surprise is the shape. It looks sort of like a gumdrop with a recessed handle. Like the first Macintosh, the iMac is much smaller than typical PCs and is quite easy to move around. Computer users who didn't want to lose a significant part of their desk space have to choose between a tower-shaped PC that sits under the desk or a laptop. The iMac is by no means tiny, but certainly will not force many people to find room for it in their homes.

The iMac is much more than just a semi-clear art piece, however. Apple has gotten rid of a piece of hardware that everyone used to think was inherently part of a computer: the floppy drive. The iMac comes with a CD-ROM drive, a modem, and a fast Ethernet connect built-in, but no floppy drive. Apple's reasoning for this is that almost no software comes on floppies anymore, and most people will want to back up over the Internet. Even if Apple is wrong, there will be external floppy drives for sale.

The other somewhat revolutionary change is that this is the first Macintosh in over a decade with no SCSI port. Instead, Apple has based the iMac on the Universal Serial Bus, or USB. Many new PCs have USB ports, but there are almost no devices for them on the market. However, Apple's move will probably get USB-based hard drives on the market quickly. The iMac also has no serial port: all expansion devices, such as printers, have to be based on USB.

If there's anything that's going to kill the iMac, it's the lack of connection to today's printers. Apple has always been at a disadvantage by forcing its users to buy printers that used the AppleTalk network instead of the typical parallel port used on PCs. Now forcing another change, to USB, could push printer makers over the edge. On the other hand, it is likely that some printer makers were planning on USB-based printers anyway, since they can run much faster than parallel-port printers. However, it remains to be seen how many printer makers will have USB printers ready when the iMac ships in August.

Retro Is In, Again

In some ways, the iMac can be compared to the new Volkswagen Beetle, and it wouldn't be surprising if Apple ran ads with nostalgic overtones. The round edges everywhere, the stylish

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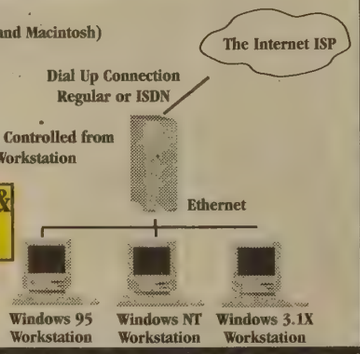

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colors, and the fact that Apple had almost gone the way of old VWs make the comparisons all the more apt.

Like the first Macintoshes, the iMac is an all-in-one system aimed at low-end users who don't want to fight with the hardware and software hassles of updating Intel-based systems, whose architecture is now seventeen years old. Upgrading PC systems with things as simple as a sound card or additional RAM is still incredibly painful. The new Mac comes with almost everything many users would want pre-installed, and most hardware upgrades will be through the USB ports, which should make adding anything quite painless, as long as hardware vendors make what you want with a USB interface.

In some ways, the iMac can be compared to the new Volkswagen Beetle, and it wouldn't be surprising if Apple ran ads with nostalgic overtones.

The iMac will also come with a full complement of low-end office and Internet software. More important to users, however, is that it still runs Mac OS, which is still more stable than Windows 95. In a world where even Microsoft advertises Windows 98 as "crashes less often than Windows 95," it is no wonder that current Mac users are Apple's best salespeople for new customers.

Better Directions For Mac OS

Soon after the announcement of the iMac, Apple revealed its new development plans for the Macintosh operating system.

Apple's previous plan, to move all high-end users to a new operating system called Rhapsody, had lost Apple many of its important developers because changing to Rhapsody would entail rewriting most of their programs.

The new plan kills Rhapsody off after the first version is released this fall. In its place, high-end users will get a somewhat new OS next year, called Mac OS X (that's "X" for "ten"). Mac OS X is Apple's admission that Rhapsody was too unpopular and was losing Apple its second most valuable resource (after customers): developers. The new OS will require programmers to modify very little of their current programs in order to get all the benefits of the new OS.

Mac OS X will essentially combine the stability and speed of Rhapsody with Mac OS 8 systems calls. Developers who move their programs to Mac OS X will get features that Apple has been promising for a long time: virtual memory, protection from other programs, multi-threading, and even support for multiple CPUs. Basically, these features promise users more stability, at a price of needing more RAM and faster CPUs. Apple said that only Macintoshes with the new PowerPC G3 CPUs will run Mac OS X.

Apple also promised to keep developing Mac OS 8 for at least the next few years. Version 8.5 is expected this fall, and versions beyond that are already being planned for next year. Apple said it would release new versions of Mac OS 8 every six months, although, like Microsoft, Apple pretty much always misses its dates for operating system releases. Apple's renewed focus on its

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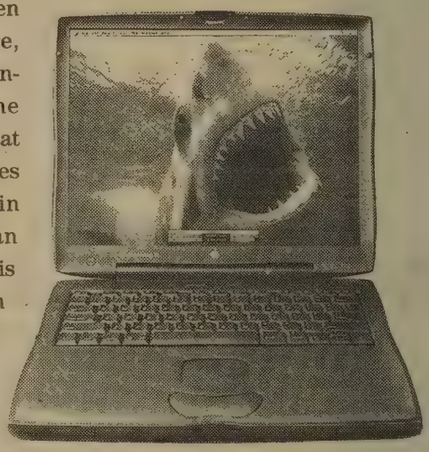
current customers makes it likely that Apple will keep Mac OS 8 alive for at least two more years.

Mac OS 8.5 will include many features that people expected in Mac OS 8.0, which was released last year. For example, the Open and Save dialog boxes will (finally!) be replaced with a much more useful interface based on the rest of the Mac look and feel. There will also be "interface themes" that let you change many of the ways the Mac looks. Novice users seem to love themes, as evidenced by the thousands that have been created for Windows 95.

In a world where even Microsoft advertises Windows 98 as "crashes less often than Windows 95," it's no wonder current Mac users are Apple's best salespeople.



Apple will also revise its Open Transport networking software, which is the method used to connect Macs to LANs and the Internet. (It should be noted that Microsoft made almost no changes to its networking software in Windows 98, and setting up an Internet account in Windows 98 is just as messy as it was in Windows 95.)

More important to many users will be speed improvements in Mac OS 8.5, mostly due to making more of the source code PowerPC native. Although Apple's new systems are incredibly fast, older PowerPC systems have lagged behind due to Apple's not converting all of the Mac OS to PowerPC source code. There will still be some 68000-based code left in Mac OS 8.5, but the new code in the QuickDraw library will make graphics much faster, particularly on early PowerPC systems.

Renewed Hope For Customers

Apple's third announcement, of a set of high-priced laptops, was nothing to cheer about, unless you feel like dropping over $3500. These systems are priced at or above competing PC systems. This news was so unimportant, it barely got mentioned after the iMac announcement.

But, together, the iMac and Mac OS X announcements have given Apple's loyal customers something to hold on to. Even more important, it gives Apple something to attract the interest of new users. They particularly need this after losing so many customers last year, especially after Apple jerked the rug out from under the Mac clone market. Now, with Windows 98 looking like a minor revision to Windows 95, and nothing exciting in the PC hardware business coming around, Apple has another lease on life. They could even regain their market share, something that six months ago seemed all but impossible. ◆

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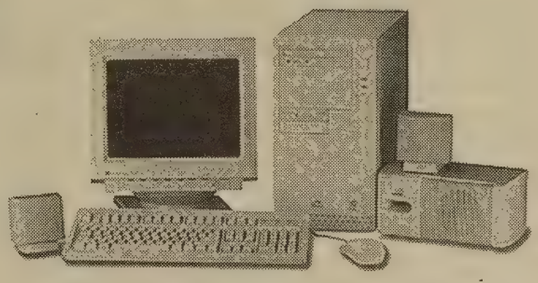

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OEM 60W / 200W / 240W / 320W
Stereo Speakers ..... $8.99 / 21.99 / 26.99 / 27.99

VGA CARDS

Trident 9680 PCI-2MB..... $29
S3-Virge 3D 64 PCI-2MB..... $39
Diamond Stealth 4000AGP 4MB SGRAM $69
Diamond Viper V330 w/4MB SGRAM. $129
Matrox Mystique II PCI 2MB/4MB .... Call
Matrox AGP 4MB $129
Trident 9685 PCI 4MB..... $49
Trident Video 87 AGP 3D 4MB $59
ATI Expert at Play PCI 4MB SGRAM..... $169
ATI 3D Expression 4MB DRAM $89

510.354.0835

CLS INC.

Fax: 510.440.9566
48521 Warm Springs Blvd., Suite 317
Fremont, CA 94539
Store Hours: Mon-Fri 10:00am to 6:00pm

MicroTimes Stock Index Heads Sharply Higher

EXCH	COMPANY	TICKER SYMBOL	CLOSING PRICE 05/29/98	CLOSING PRICE 06/25/98	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE										
NAS	Adobe	ADBE	39.94	44.38	4.44	11.11	20	0.20	0.45	53.13	33.50
NAS	Autodesk	ADSK	42.50	39.19	-3.31	-7.79	19	0.20	0.51	51.13	30.50
NAS	Broderbund	BROD	16.00	20.69	4.69	29.30	-	0.00	0.00	37.75	15.25
NAS	Informix (L)	IFMX	6.81	7.84	1.03	15.14	-	0.00	0.00	12.44	4.00
NAS	Inprise Corp.	INPR	8.31	7.19	-1.13	-13.53	-	0.00	0.00	12.19	5.88
NAS	Macromedia (H)	MACR	15.84	18.56	2.72	17.16	-	0.00	0.00	18.69	7.13
NAS	Microsoft (H)	MSFT	84.81	101.56	16.75	19.75	65	0.00	0.00	105.13	59.00
NAS	Novell (H)	NOVL	10.50	12.69	2.19	20.83	-	0.00	0.00	13.44	6.28
NAS	Oracle	ORCL	23.63	24.69	1.06	4.50	30	0.00	0.00	42.13	17.75
NAS	Symantec	SYMC	23.88	25.88	2.00	8.38	18	0.00	0.00	32.63	17.88
	HARDWARE										
NAS	Apple	AAPL	26.63	28.56	1.94	7.28	-	0.00	0.00	31.63	12.75
NYS	Compaq	CPQ	27.38	29.13	1.75	6.39	31	0.10	0.34	39.75	19.63
NAS	Dell	DELL	82.41	92.00	9.59	11.64	63	0.00	0.00	98.50	28.06
NYS	Gateway 2000	GTW	45.06	48.56	3.50	7.77	65	0.00	0.00	59.25	25.06
NYS	Hewlett-Packard	HWP	62.31	60.50	-1.81	-2.91	21	0.60	0.99	82.38	53.63
NYS	IBM	IBM	117.50	112.44	-5.06	-4.31	19	0.90	0.80	129.31	88.63
NYS	Silicon Graphics	SGI	12.00	11.94	-0.06	-0.52	-	0.00	0.00	30.31	10.94
NAS	Sun Microsystems	SUNW	40.06	43.94	3.88	9.67	24	0.00	0.00	53.31	30.38
NYS	Tandy (H)	TAN	44.25	53.81	9.56	21.61	31	0.40	0.74	53.81	26.31
NYS	Xerox	XRX	102.88	101.50	-1.38	-1.34	28	1.40	1.38	115.00	66.19
Note: Digital Equipment merged with Compaq.											
	CPUs										
NYS	Advanced Micro Devices (L)	AMD	19.56	18.06	-1.50	-7.67	-	0.00	0.00	42.75	16.38
NYS	Cypress Semiconductor	CY	8.56	7.94	-0.63	-7.30	-	0.00	0.00	18.94	7.38
NAS	Intel (L)	INTC	71.44	75.63	4.19	5.86	22	0.10	0.13	102.00	65.66
NYS	LSI Logic	LSI	21.31	23.69	2.38	11.14	22	0.00	0.00	36.75	18.63
NYS	Motorola (L)	MOT	53.00	52.94	-0.06	-0.12	31	0.50	0.94	90.50	48.56
	COMMUNICATIONS										
NAS	3Com (L)	COMS	25.38	31.50	6.13	24.14	51	0.00	0.00	59.69	22.94
NYS	AT&T	T	60.88	58.38	-2.50	-4.11	20	1.30	2.23	68.50	34.00
NYS	BellSouth Corp. (H)	BLS	64.50	67.56	3.06	4.75	19	1.40	2.07	69.50	43.31
NAS	Cisco (H)	CSCO	75.63	87.06	11.44	15.12	92	0.00	0.00	89.44	43.38
NAS	MCI (H)	MCIC	53.47	57.25	3.78	7.07	-	0.10	0.17	58.00	27.31
NYS	Northern Telecom	NT	64.00	56.25	-7.75	-12.11	46	0.30	0.53	69.25	39.69
	INTERNET										
NAS	EarthLink (H)	ELNK	54.50	72.25	17.75	32.57	-	0.00	0.00	78.00	10.00
NAS	Netscape	NSCP	24.50	27.19	2.69	10.97	-	0.00	0.00	49.50	14.88
NAS	Yahoo (H)	YHOO	109.50	152.25	42.75	39.04	-	0.00	0.00	152.25	21.75
	MEDIA										
NYS	Disney	DIS	113.25	112.50	-0.75	-0.66	36	0.60	0.53	128.38	73.81
NAS	TCI (H)	TCOMA	34.31	39.25	4.94	14.39	-	0.00	0.00	44.00	14.13

KEY: NYS=NEW YORK ASE=AMERICAN NAS=NASDAQ
(H)=NEW HIGH REACHED IN PERIOD (L)=NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES	24
DECLINES	12
UNCHANGED	0
NEW HIGHS	10
NEW LOWS	5

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER	Yahoo	$ 42.75
LARGEST DOLLAR LOSER	Oracle	$ -7.75
LARGEST PERCENTAGE GAINER	Netscape	39.04 %
LARGEST PERCENTAGE LOSER	Oracle	-13.53 %

	CLOSE 05/29/98	CLOSE 06/25/98	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD
MICROTIMES STOCK INDEX	12300.89	13056.81	755.93	6.15
DOW JONES INDUSTRIAL AVERAGE	8899.95	8935.58	35.63	0.40
STANDARD & POOR'S 500 INDEX	1090.82	1129.28	38.46	3.53
N.Y.S.E. COMPOSITE	565.28	576.14	10.86	1.92
NASDAQ COMPOSITE	1778.87	1863.25	84.38	4.74

CLOSING QUOTES FOR GRAPH:

DATE	MICRO TIMES	DOW JONES
12/10/97	10922.72	7978.79
01/14/98	10813.50	7784.69
02/05/98	11808.05	8117.25
03/05/98	11573.81	8445.08
03/31/98	12466.06	8799.81
04/30/98	12934.83	9063.37
05/29/98	12300.89	8899.95
06/25/98	13056.81	8935.58

Source: Nordby International Inc. (*www.nordby.com*), Boulder, CO.
This information is based on sources believed to be reliable, and while extensive efforts are made to assure its accuracy, no guarantees can be made. Nordby International assumes no liability for any inaccuracies. For information on Nordby's customized financial research services, call (303)938-1877.

The national indices turned in mixed results last month, as the Asian crisis again heated up. The Dow Jones Industrial Average nudged 0.40% higher, or 35.63 points, to close the monthly trading session at 8935.58. In sharp contrast, the high technology NASDAQ increased 4.74%, or 84.38 points, to a close of 1863.25.

The *MicroTimes* Stock Index followed the NASDAQ's climb, as our index was buoyed by impressive performances from Internet issues. Our index jumped 6.15%, or 755.93 points, to close the monthly trading period at 13056.81. In our index, advancing issues outpaced decliners by a 24-to-12 count, and ten companies reached annual highs versus five that fell to a 53-week low.

Turning To Stocks In The Accompanying Table

IBM stocks collapsed amid gathering concern among traders for the near-term prospects of blue-chip tech companies. Goldman Sachs analyst Laura Conigliaro removed IBM from the firm's "Global Priority" list of stocks and pared down earnings estimates for the second and third quarters, saying that Asian worries, added to IBM's challenges in the personal computer market, "have probably all but eliminated upside possibilities for the current quarter." IBM closed down -4.31%, to end the month at $112.44.

News that the merger of MCI Communications and WorldCom will be approved by the European Union kicked MCI skyward, up 7.0%, ending at %57.25. News that Cable and Wireless dropped its suit against MCE also cheered traders as MCI rode the Internet magic carpet to complete the week as largest percentage gainer.

Shares of Yahoo! rocketed higher last month as commerce on the Internet continues to boom. When the books were closed on the monthly trading session, Yahoo!'s stock increased 39.04%, or $42.75 per share, to a close of $152.25. ◆

HSC Electronic Supply

Serving Silicon Valley since 1964!

...brings you a potpourri of high-tech goodies for the techno-tinkerer!
For thirty years we have been your source for Silicon Valley exotica!

Leftover Apple Goodies...

Macintosh IIci System unit, used
- Includes 8 MB RAM, 80 MB hard drive, cache card
- Does not include monitor, mouse or keyboard
- Note, some available with larger hard drives at higher price

HSC#17394 $79.00

Macintosh Keyboard (used)
- Macintosh Extended Keyboard II (Mac II series), no cable

HSC#17386 $24.95

Macintosh Keyboard (used)
- Apple Design Keyboard (Performa Series)

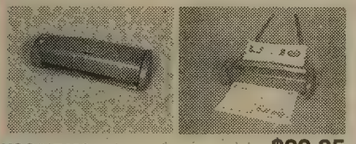
HSC#96382 $32.50

Macintosh Mouse
- New in bag, older square-cornered mouse

HSC#96380 $12.50

Mini-Scanner Deal!

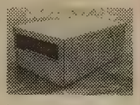
Primax Sheet-feed Greyscale Scanner
- The perfect scanner for desktops or laptops on the go!
- Use as input device for your fax software -- anywhere!
- Built-in document feeder holds up to ten pages
- Parallel-port cable included -- no special interface cards
- Includes Win 3.1, 95 software, OCR software, AC Adapter
- 300 dpi, new in box, 90-day warranty, unbelievable price!



HSC#17406 $29.95

External SCSI Drive Cases

- Bargain case for 5.25" drives, brand new!
- 7" x 4.5" x 10.5" overall size
- 50-pin SCSI connectors
- SCSI ID switch
- 65W Power supply (lots of power for hard drives, etc.)
- Fan-cooled, uses standard IEC Power cord (not included)



HSC# 17130 $39.95

- High quality low profile case for 5.25" drives, brand new!
- 7" x 2.25" x 11" overall size
- 50-pin SCSI connectors, RCA Audio connectors
- SCSI ID switch, termination switch
- *Tiny* 12W Power Supply (5VDC @ 1.4A, 12VDC @ .4A, probably only good for CD-ROM's)
- Fan-cooled, uses standard IEC Power cord (not included)

HSC# 17357 $29.95

- High quality case for 3.5" drives, used, like new!
- 6.5" x 2.5" x 10" overall size, good for tape drives!
- 50-pin SCSI connectors, SCSI ID switch
- Drive bay snaps out for easy access to cables
- 40W Power Supply (5VDC @ 2A, 12VDC @ 2.5A)
- Fan-cooled, uses standard IEC Power cord (not included)

HSC# 17356 $19.95

ATX Pentium Power!

- Bargain on new Micronics ATX Pentium Motherboard!
- Support for Intel Pentium 90-200, 166-200 MMX CPU's
- Also supports Cyrix/IBM 6x86 P, PR 150 & 166 CPU's
- Also supports AMD K5, and, with special VRM, K6 CPU's
- 4 PCI slots, 4 ISA slots (one shared), 16-bit stereo sound
- 4 DIMM RAM sockets, parity or non-parity, ECC, EDO, FP
- On-board 2 x IDE, 2 x 16550 Serial ports, 1 parallel port
- New, 90-day warranty (CPU not included)

HSC# 80437 $49.95

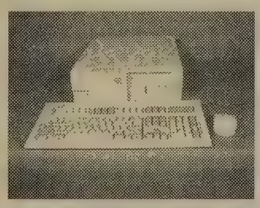
Infrared Connections!

- IBM "Options" series ISA-Bus and PCMCIA card adaptors will add industry standard infrared communications capability to your desktop PC (with ISA slots) or notebook computer! (Win95 instructions available on our website)
- Allows wireless connection to compatible notebooks, workstations, printers, and other peripherals supporting the Infrared Data Association (IrDA) standard.
- Also will emulate a COM port for cable-less hook-ups
- Communicates up to 115KBps, or up to 1.152MBps with the included TranXit Software.
- Operates over distances up to 3 meters (10 ft.)
- Includes Card, transceiver module, driver disk & book
- Both styles new in box, 90-day warranty

HSC#16483 PCMCIA Version $19.95
HSC#16813 ISA-Bus Version $19.95
Or a package deal...get both for $29.95

Used IBM PC's - Big Savings!

IBM Valuepoint computers, various configurations
- Just removed from a network installation at a hospital
- Several levels of performance to choose from!
- All have system box with VLB/ISA motherboard, CPU, RAM, hard & floppy drive, 2 serial, 1 parallel port, 3-Com token ring card, 101 keyboard, mouse, 90-day warranty
- On-board 1MB SVGA video, plug in your monitor & go!
- Configurations vary, call for availability -- for example:
- 486SX-25 CPU, 8MB RAM, 127MB hard drive: **$129!**
- Or: 486DX2-50, 8MB RAM, 270MB hard drive: **$179!**
- Or: 486DX2-50, 8MB RAM, 540MB hard drive: **$189!**
- Or: 486DX2-66, 16MB RAM, 365MB hard drive: **$199!**
- You will need to install the operating system of your choice
- Purchase with one of the Sony CPD-1320 monitors seen above and take 10% off the package price!



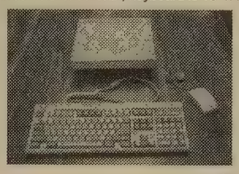
Accelerated Serial Ports!

- High-speed serial port card for Micro-Channel Computers
- Hayes **ESP Dual-Port Communications Accelerator**
- Data rates up to 921,600 bps, on-board co-processor
- Supports up to 28,800 bps modems, Win 3.1, New in box

HSC#17405 $29.95

X-Windows Terminal!

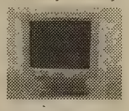
- Tiny Axil/Hyundai X/11C smart terminal has big features!
- Connect to Ethernet (Coax or AUI), SLIP, or both!
- Built-in 10Base2 transceiver, 10Base5 AUI interface
- Uses a variety of protocols, TCP/IP, SLIP, TELNET, RARP, BOOTP, XDMCP, or PPP
- Comprehensive self-test and help menus for setup
- Requires 63.775KHz Horizontal, 67.9Hz Vertical (workstation-type) monitor, resolution is 1152 x 900
- RAM can be upgraded to 16MB (4MB SIMM included)
- New in box, includes 101-key keyboard, mouse, manual
- Measures 11.5" x 11" x 2", keyboard is 18" x 7"



HSC#17213 Now, lower price! $99.95

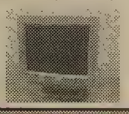
Monitor Mega-Deal!

- Just in! Two types of used, high-quality monitors!
- Sony CPD-1320 VGA Monitor -- Genuine Trinitron!
- 14" Super-Fine Pitch (tm) Trinitron tube, 13.24" view area
- Supports 640 x 480 (VGA), 60/70Hz res. (not SVGA)
- Ultra-sharp .25 mm dot pitch for crisp image edges
- Used, tested good, 90-day warranty



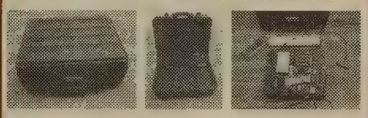
HSC#17395 $69.00

- Apple Performa Plus Display
- 640 x 480, 67Hz color display, .29 mm dot pitch
- 14" picture tube, 11.63" viewable area, tilt/swivel stand
- Used, tested good, 90-day warranty



HSC#17396 $139.00

Briefcase of Goodies!



- These handsome hardshell cases were used to carry a laptop-computer estimating system (laptop not included)
- They were used with a Compaq LTE laptop, and provided a SCSI port for a CD-ROM drive with battery back-up
- Large Nicad pack has 10 D-size Sanyo Cadnica cells.
- Built-in 19VDC power supply for battery charging
- Tiny piggy-back PC board seems to be a SCSI interface
- Case measures 18" x 14" x 7", with several compartments
- SCSI II to CEN50 SCSI cable, many great parts inside!
- Buy either the whole assembly, or just the parts you want!
- Not guaranteed to function with laptops -- for parts only!

HSC#17180 Complete Laptop Case $39.95
HSC#17182 Empty Hardshell Case $19.95
HSC#17181 Nicad Pack, 12.5VDC, 5AH $17.50
HSC#17179 SCSI II Cable, 1 ft. long $12.50

Stepping-Motor Setup!

- Used Compumotor indexer, driver & motor, with cables!
- Model 172 indexer, LE series driver, & LE57-51 motor
- Sorry, no other information available -- 30 day warranty

HSC#17397 $125.00

HP ScanJet Special

- Wow! HP ScanJet 3P flat-bed greyscale scanners at $59!
- Complete with stand, SCSI adapter, cables, and optional document feeder, at an unbelievable price!
- SCSI Interface, works with Mac or PC (Mac s/w incl.)
- 300dpi resolution (native mode), 1200dpi with dithering
- Information provided on where to download PC drivers
- Dealer display models & shelf stock returns (boxes may be opened, but scanners are unused)
- Optional 20-page feeder can be installed in place of cover
- Scan rate of 10 seconds for letter-size page
- Factory RMA's from dealers, unused, 90-day warranty

HSC#17392 $59.00

Hand-held UV Lamp

- "Derma-spec" lamp was made for Avon products to examine the face for "problem" cosmetic areas!
- Works fine for counterfeit bill & credit card detection, minerology, fluorescent art effects, etc.
- We wouldn't use these on our faces for too long...

HSC#17383 $12.95

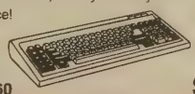
Corel Office Professional 7

- Great Software Bundle -- Amazing Value!
- Includes Corel Wordperfect 7, Corel Quattro Pro 7, Paradox 7, Corel Presentations 7, CorelDRAW 6, CorelFLOW 3, Sidekick 95, Netscape Navigator, Dashboard 95, 1000 fonts, 10000 clip-art images, more!
- For Windows 95, Windows NT 3.51 and Windows NT 4.0
- Distributed on CD-ROMs, with hefty manual pack
- New, shrink-wrapped in box, 90-day warranty

HSC#80436 $47.50

Parallel-Port Keyboard!

- Perfect for notebook computers, laptops, palm-tops, etc.
- Full-size 101 keyboard by ALPS, model LPT 101
- Includes manual, installation diskette
- New in OEM box, 90-day warranty
- New Price!



HSC#17160 $39.95

Rugged Mike & Speaker!

- Extra-heavy duty hand-held microphone & enclosed speaker for extreme environmental use
- Made by GE for Ericsson EDACS "Orion" mobile radios
- Easily modifiable for your own use (ham, CB, etc.)
- Brand new in box, with custom Ericsson power cable

HSC#17172 Mic/Speaker set $29.95
HSC#17172A Microphone only $14.95
HSC#17172B Speaker only $14.95

Quick, Cheap, Easy IDE!

- What more could you want in an IDE controller?
- Creative Technology CT1871 Plug and Play card
- Perfect for CD-ROM's, other non-bootable SCSI devices
- 16 bit short ISA card has minimum parts count
- Supports up to two CD-ROM drives
- All settings are PnP settable, supports all ATAPI drives
- New, OEM bag with spec. sheet, 90-day warranty

HSC#17358 $3.95

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- Pay us a virtual visit on the World Wide Web!
- Simply point your browser to *http://www.halted.com*
- Site is constantly being revised, please visit often!
- Check out the amazing "Gizmo of the Week" feature!

HSC Catalog online!

- That's right, get HSC's catalog on the World-Wide Web!
- Simply go to www.halted.com and follow the big red link.
- Adobe .PDF files are available for download and viewing.
- Or drop on by and pick one up...we'd love to see you!

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4837 Amber Ln., Sacramento, CA 95841 (916) 338-2545 *FAX your orders to:*
5681 Redwood Dr., Rohnert Park, CA 94928 (707) 585-7344 *(408) 732-6428*

Terms: Some quantities limited; all items subject to prior sale. **Minimum order: $10.00 plus shipping.** Orders under $20.00 subject to $2.00 handling fee, in addition to shipping. All orders shipped FOB Santa Clara, CA (this means you pay freight!) by UPS Surface (no P.O. Boxes) unless otherwise specified, in which case prevailing carrier rate plus $5.00 handling fee applies. Prepaid orders that don't include shipping charges will be shipped freight COD. There is a $4.75 UPS charge added to shipping charges for COD shipments. If you have questions about your order, please call Customer Service at (408) 732-1854 M-F 9AM to 5PM PST.

Truth In Scanning

Legal Accountability For Point-Of-Sale Systems

By Jim Warren

Kopp's bill would require the state Secretary of Food and Agriculture to "ensure that an item's price retrieved through the point-of-sale station is equal to or less than the lowest price that is advertised for that item."

Several decades ago, there was a brief battle in the California legislature over use of the bar-code scanners that are now standard tools in calculating your bill in most supermarkets and department stores. At least part of the issue was retailers' desire to stop the labor-intensive and delay-prone process of marking the price on each individual item—massively more costly than merely displaying the price on a shelf label near the product.

One of the concerns voiced by consumer activists at the time was that, without pricing marked on each item, it would be difficult for you to check the accuracy of your bills. But since a computer was printing the shelf labels as well as providing the pricing to the cash register at the checkout stand, of *course* there wouldn't be any significant errors...

Some cynics (realists?) even darkly suggested that maybe, just maybe, *some* unscrupulous retailers might intentionally program their computers to charge higher prices at the checkout stand than they print on the shelf labels, or "accidentally" increase the prices in the point-of-sale computers before they increased the prices marked on the shelf labels—doing either, regularly or randomly.

Disregarding those quaint theoretical arguments, the political reality was—and is—that the retailers' associations are among some of the more effective lobbyists in the state. We all know the results:

- Unit pricing is no longer marked on most items, and is *supposed* to be posted on a nearby shelf. Usually, it really is. Often, you can even figure out which price label goes with which similarly-named item among the mish-mash array of nearby products.
- But—*surprise!*—the actual price you are charged by the checkout computer differs from the price on the shelf label—almost 4% of the time, according to a study by one state agency.

Worse still, in October, 1996, the Federal Trade Commission released a study reporting that nationally, scanner-based prices were in error 4.8% of the time. (In fairness to the retailers, this well may be better than the error rate for old-fashioned human checkout—but then again, it *should* be!)

Pro-Retailer "Accidents"

"Computer error," say some retailers. "Occasional mistake by a shelf clerk," say others. *Horse puckey* says I!

The same California Department of Food and Agriculture study that reported that scanner pricing was accurate 96.3% of the time also reported that 2.2% of the errors were overcharges, but only 1.5% were undercharges—hardly a "random" error!

(For the study, according to an April 5, 1997, article in the *San Francisco Chronicle*, the state purchased 9,000 items in 127 grocery stores and 173 auto, hardware, drug, and discount stores.)

There is general agreement that most scanner-related overcharges occur on sale items—where the price in the scanner's computer has been decreased after the lower sale price is advertised or posted on the shelf, or is increased before the shelf price or advertised price is changed to reflect the end of the sale.

In other words, it's a management problem; not a computer problem.

Kopp Wants Government Policing

At the urging of the head of San Francisco's Department of Weights and Measures, state Senator Quentin Kopp (I-San Francisco) introduced Senate Bill 369 last year, calling it the, "California Shops with Confidence Consumer Protection Act." (More usefully, it's called a "point-of-sale station accuracy" bill in the legislature's computer, at *www.sen.ca.gov/htbin/ca-search-bills* .)

SB369 would allow counties the option of charging supermarkets and other retailers that use scanners an annual registration fee of $25 to $75, to be deposited in the county's general fund and used to pay for establishing or expanding the county's point-of-sale inspection bureaucracy.

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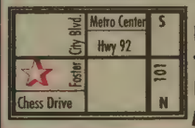

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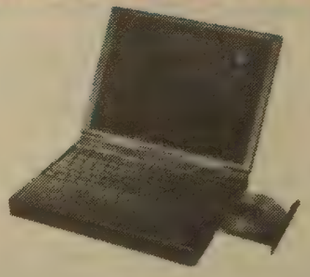

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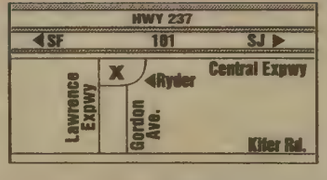

But folks, it ain't likely that the scanners are making the errors that so favor the retailers. It's "conveniently" sloppy mis-management of the shelf-pricing operations, or intentionally fraudulent activities by the retailer's computer programmers and their managers.

Among other things, Kopp's bill would require the state Secretary of Food and Agriculture (with whom supermarket associations try to maintain very cozy relations) to, "establish procedures to ensure that the verification of an item's price retrieved through the point-of-sale station is equal to or less than the lowest price that is advertised for that item."

Although Kopp introduced SB369 in February of 1997, as of mid-June, 1998, the bill was still locked up in the Senate, with no action on it since April 22nd when the Senate Committee on Appropriations had placed it in their suspense file.

Better Than County Inspectors

Even contentious government inspectors have much less incentive than we consumers do to be vigilant against overcharges. This is especially true given that inspectors' jobs are rigidly protected by civil service rules as well as public employee union stewards. Even worse, local inspection schedules can easily be "leaked" to politically connected or financially "friendly" retailers.

Retailers have great incentive to make sure they don't *underbill* customers—and by the state study, do so less than 1.5% of the time. But they have no incentive at all to avoid overbilling, other than their reputations and business ethics.

When retailers were first lobbying for permission to stop marking prices on individual items, and the now-proven specter of "accidental" errors between shelf pricing and checkout charges that "just happen" to favor the retailers was first proposed, I suggested an easy solution. I still like it:

If the price charged at a point-of-sale station to the customer exceeds the advertised price or price marked on a shelf label, then, upon verification by any government official (e.g., a local beat cop), the retailer shall immediately pay the overbilled customer 100 times the cost of the item or $1,000, whichever is less. (And, the cop might buy some doughnuts in the process.)

Please Big Brother, let us do it ourselves!

How About A Whistle-Blower Reward?

Then there is the issue of business owners or managers having a programmer intentionally modify their computer programs to defraud the public, by printing shelf-label prices different from the point-of-sale prices, or by intentionally increasing scanner prices on a regular or occasional, random basis (similarly, some gas station operators have been caught with pump computers "hacked" to erroneously increase the pump's volume and price counters on a regular or even random basis; some even had switches that they could use if they spotted a weights and measures inspector approaching a pump).

Instead of attempting a costly, delay-prone, court-clogging *criminal* trial of such intentional fraud, how about awarding any programmer or other employee who provides proof of such instructions and their implementation to, say, the local District Attorney, to collect, say, 50% of the business' profits as reported on their last income tax—with the evidence and award to be filed as public documents with, and enforced by, a civil court of competent jurisdiction?

This would reward the whistle-blower, underwrite their finding new employment, and costs a tiny fraction of a questionable criminal prosecution—thus, indirectly, repaying the tax-paying public for being ripped-off.

And it offers the most frightening of all threats to business—loss of profits. ◆

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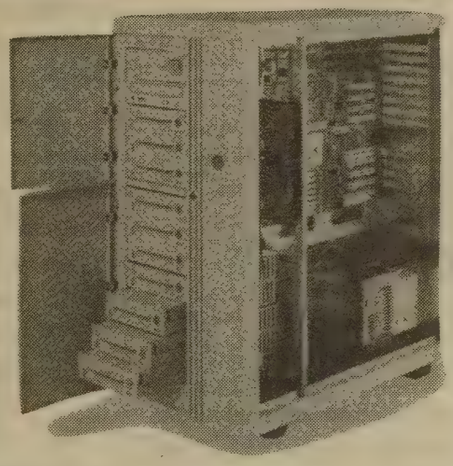

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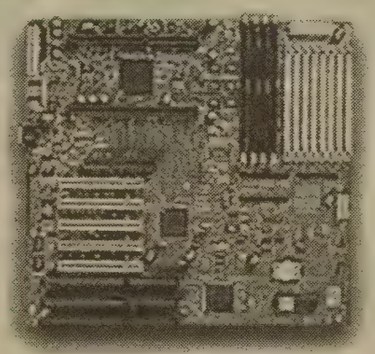

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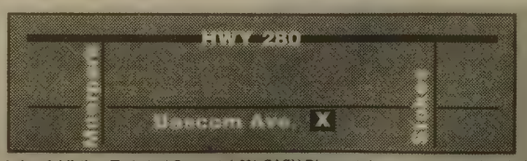

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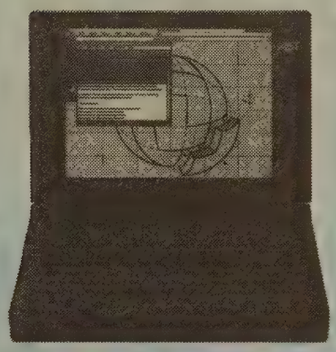

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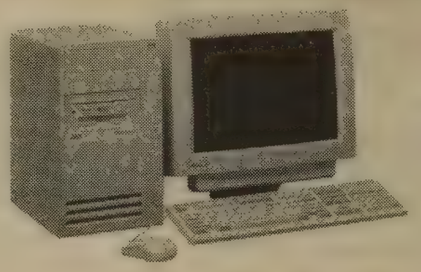

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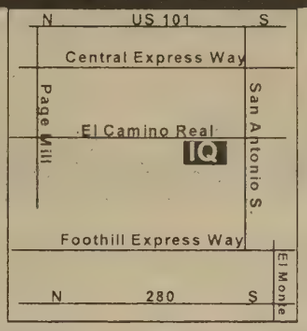

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Libertarianism Of Convenience

Political Hypocrisy In Cyberspace

By David Kline

Take Scott "Just Say No to Government" McNealy. For a man who is famous for railing against "cry-baby industry watchdogs," he sure has been whining a lot over the past year for the Justice Department to get Microsoft off his competitive back.

When husband-and-wife researchers Donna Hoffman and Tom Novak (*www.microtimes.com/prof.html*) published a study recently showing that lower-income Blacks were far less likely to have Internet access than whites of similar economic status, they had no idea it would generate such a firestorm of hate mail.

After all, as respected Vanderbilt University professors, Hoffman and Novak had been tracking Internet demographics and usage patterns for years, but none of their previous studies had sparked much controversy. This one, however, clearly struck a nerve.

"I was shocked by the response," says Dr. Hoffman. "It wasn't just the 200 angry postings on the [Wall Street Journal's and ZDNet's] news sites that reported on our study. It was also the personal email we received. Some of it was openly racist; most of it was very, very hostile. The main complaint seemed to be: 'Oh great, another bleeding-heart liberal calling for government intervention!'"

Such fervent hostility to any mention of the political or social dimensions of today's high-tech revolution stems from the apparently-pervasive belief in Silicon Valley that social or political issues have no place in an industry that has so clearly demonstrated the virtues of supposedly-pure free market forces.

This cyber-libertarian worldview is, of course, practically the state religion of Silicon Valley's business community. Executives such as Cypress Semiconductor's T.J. Rodgers and Sun Microsystems' Scott McNealy have for years called for government to "get out of the way" of industry. Politics, they and their CEO brethren claim, will only destroy the high-tech industry's success. Unless, of course, it's *their* politics that are at issue.

Take Scott "Just Say No to Government" McNealy. For a man who is famous for railing against "cry-baby industry watchdogs," he sure has been whining a lot over the past year for the Justice Department to get Microsoft off his competitive back. Well, now he's got his way—and that's a government you just can't say no to, eh Scott?

Or how about T.J. "Free Minds, Free Markets" Rodgers? This self-appointed gladiator against "coercive government utopianism" is one of the biggest backers of a proposed federal bill that would severely restrict the rights of shareholders to sue companies for fraud or other misdeeds. Nothing wrong with a little "coercive government" when it helps your own bottom line, eh T.J.?

And then there's Bill Gates, of course, who (for obvious reasons) has been among the loudest critics of government intervention in the high-tech industry. Unless, of course, we're talking about *his* kind of government intervention. It seems that Gates was the chief promoter of a bill passed by the Senate last month that allows high-tech firms to import even more cheap foreign labor rather than hire American workers. Apparently, Mr. Bill isn't above bundling his anti-government rhetoric with a little pro-business government lobbying when it suits him.

In fact, Silicon Valley's business community is fast becoming one of the most powerful political forces in Washington. Whether it's lobbying for expanded visa quotas on cheap foreign tech workers, pushing for crippling restrictions on shareholder lawsuits, or fighting against taxation on the Net, high-tech's free-marketeers sure can get political when it suits them.

But let anyone mention racial disparities in Net access, consumer protection for PC users, worker rights or training, or basically any corporate responsibility issues, and these same high-tech politicos get all flush with indignation about how politics will supposedly cripple the high-tech industry. How about we cut out all the posturing, guys (and you are, by the way, mostly guys). Technology and free market entrepreneurialism are, indeed, the midwives of the future. But it is politics—the how and in whose interests that future is organized—that will determine whether it's a future we want to live in. ◆

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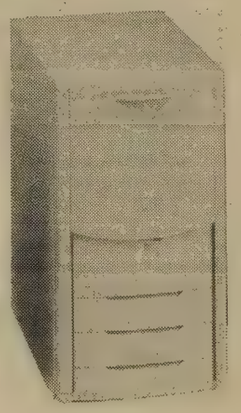

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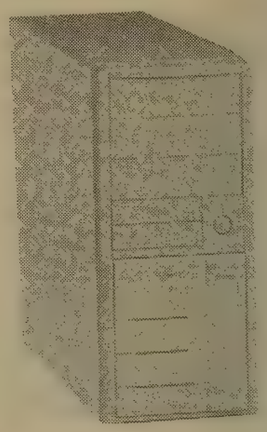

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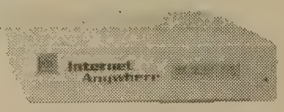

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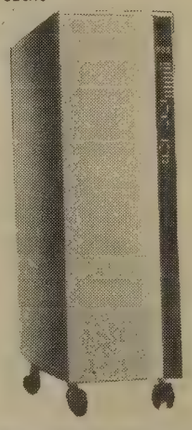

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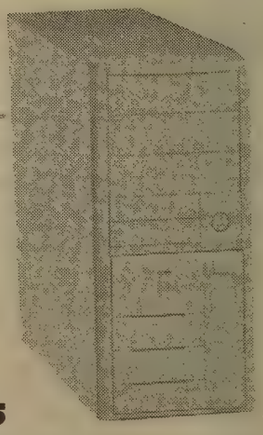

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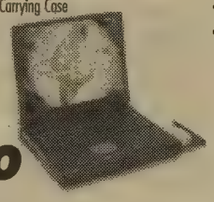

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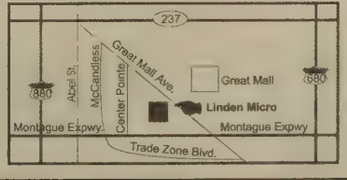
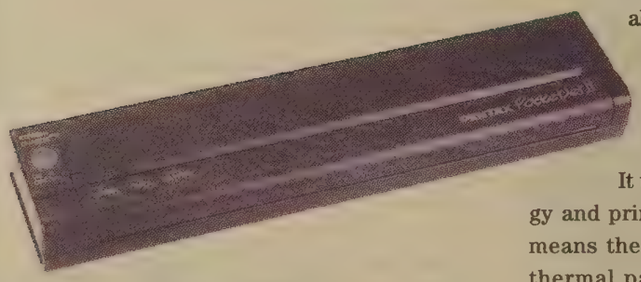


Canon Comes Out Ahead

Portable Printers For Those On The Go

By Ed Kahn

The PocketJet II is perfect for printing an occasional letter or short memo, but don't rely on it to print that just completed, 100-page proposal.



While there is no shortage of highly-portable computers, the mobile user often faces difficulties when it comes time to print. On a recent trip, for example, my solution entailed paying an exorbitant amount to print a couple pages at the local copy shop. This month, I examine a pair of portable printers that you can easily take with you on the road.

The smaller of the two printers is the Pentax PocketJet II, measuring roughly 10" wide by 2" deep by 1.25" high and weighing just over a pound (17.3 oz.). Tucked into its carrying case, the PocketJet II is reminiscent of a slide rule. This slim package has everything you need to print including a NiCad battery pack that provides enough power to print from 30 to 35 pages per charge, and will last 500 charges.

The PocketJet II works with Windows 3.x or 95 and is perfect for printing an occasional letter or short memo, but don't rely on it to print that just completed, 100-page proposal. Each sheet must be hand fed and the print speed is only three pages per minute.

It uses direct thermal printing technology and prints at 300 dpi resolution. That also means the printer uses only thermal paper, which costs $8.49 for a box of 100 sheets. While this may seem costly, remember that you have no ink cartridges to buy. Paper comes in letter size as well as legal size.

On the top is a single button. Combinations of presses and holding down the button control everything from discharging and recharging the battery to ejecting paper. For instance, a single push turns the power on, and two quick pushes turns it off. In addition to the button, there are three lights on top that show if the printer is on, if the battery is charging, and when data is being received. On the bottom are four tiny dip switches for setting the automatic timer that turns off the printer after a set period of non-use and printing self-test sheets to see if everything is working properly.

As mentioned above, the PocketJet II is great for those times when you desperately need to print several pages. It is limited to a single type of paper (thermal) and prints only in black. Furthermore, I was disappointed in the print density, especially when I compared it to the quality of a standard ink jet printer.

The PocketJet II Kit includes the printer, Universal AC Adapter/Charger, 110v power cord, 100 sheets of letter-size paper, parallel cable, battery, carrying case, diver disk, and manual. It comes with a one-year warranty. A separate configuration is needed for printing legal size documents, which costs $50 extra. An optional IrDA infrared adapter is also available ($115).

The other printer I examined was the slightly larger, but much more capable BJC-50 from Canon. It measures 11.8" wide by 4.4" deep by 1.9" high and weighs 2.1lbs. This printer is a gem.

The BJC-50 works on bubble jet technology. You will need to install the print head and ink tanks, which takes less than a minute to slip

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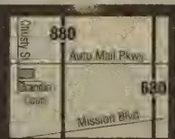

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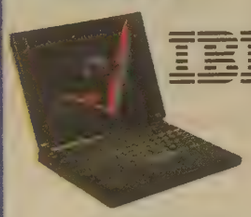

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ThinkPad 380XD	P-II/233 MMX	32MB	4.0GB+10-24X	12.1 HPA	$2665.
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ThinkPad 600	P-II/233 MMX	32MB	3.2GB+10-24X	13.3 TFT	$3822.
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ThinkPad 770	Pent-™/200 MMX	32MB	3.2GB	13.3 Active	$2867.
ThinkPad 770	Pent-™/233 MMX	32MB	4.0GB	13.3 Active	$3383.
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100CT-NT	Pentium™ 166MMX	32MB	2.02GB	7.1 AMC	$2590.
320CDS	Pentium™ 233MMX	32MB	3.82GB+20X	12.1 Dual Scan	$1911.
320CDT	Pentium™ 233MMX	32MB	3.82GB+20X	12.1 Fast Scan	$2199.
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520CDT	Pentium™ 166MMX	32MB	3.87GB+10X	12.1 AMC	$2398.
530CDT	Pentium™ 166MMX	32MB	2.02GB+10X	12.1 AMC	$2868.
530CDT	Pentium™ 166MMX	32MB	3.87GB+10X	12.1 AMC	$3078.
550CDT	Pentium™ 266MMX	32MB	3.82GB+20X	12.1 AMC	$3824.
730XCDT	Pentium™ 150MMX	16MB	2.1GB+6X	12.1 AMC	$1451.
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4210T	P/233MMX	32/96MB	3.2GB	12.1" Active Clr	$3198.
4220T	P/266MMX	32/96MB	4.0GB	12.1" Active Clr	$3648.
4160TSL	P/166MMX	16/80MB	2.0GB	12.1" Active Clr	$2278.
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Equium 100	Pent-II 300MMX	64MB	4GB+16X	Windows 95	$3105.
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Equium 7000S	Pent-II 233MMX	32MB	3GB+24X	Windows 95	$1235.
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Equium 7000S	Pent-II 266MMX	32MB	4GB+24X	Windows NT	$1414.
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into place. The head and tank come as a single unit, but tanks can be replaced without replacing the print head, which saves you money. Different types of ink have different tank capacities, but in general, costs come down to about 3¢/page for black ink and about 16¢/page for color.

The print quality is great, with 720 x 360 dpi resolution. Besides excellent quality, the printer creates black text pages at five per minute. The printer also offers color output at two pages per minute. Canon offers a range of specialty papers, including a photo paper ($9.95/20 sheets) for high-quality color prints.

The BJC-50 includes many features. It has a built-in rechargeable battery that automatically recharges from the included power supply and prints up to 100 sheets on a charge. Canon included an infrared port so you can print without using the parallel cable that also comes with this printer.

The additional feature I was most impressed with was that the print head is removable and can be replaced with a scanner cartridge ($99). This means that you can scan documents wherever you are. In addition, you can use your printer as a color copier—simply scan a document and then print it. The scanner cartridge scans at 360 dots per inch in 24-bit color. The scanner module is in short supply and I was unable to test it for this month's column. But I would assume that it works as well as the rest of the system.)

In the past, portable printers usually require you to insert individual sheets of paper, making it impractical to print longer documents even under the best conditions. Canon has addressed this by making an optional automatic sheet feeder ($59.99) that holds up to 30 sheets. The BJC-50 can handle standard paper sizes and envelopes and will print transparencies as well as a variety specialty products available from Canon. To round out the package, Canon offers a one-year warranty.

The print head is removable and can be replaced with a scanner cartridge.

The Canon BJC-50 is the portable printer i've been waiting for.

Resources:

PocketJet II Printer, $269
PocketJet II Kit, $399
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NEW! Temperature ALARM! Automatic Monitor & Control
From: $59
The Vertical 3.5" Case Kit offers a small transportable package. Ideally suited for moving around, this durable case can take a beating. Universal 35 Watt power supply.
The Horizontal 3.5" or 5.25" Case Kit Offers a stackable solution for any desktop need. Shown with Optional Bay Cooler installed.
Open Face and Closed Face Models Available.
Optional 50 or 68 Teflon Cables Available
Bay Cooler Kit keeps those HOT Ultra SCSI Drives COLD as ICE!
Dual Fan & Bracket $29
HOT SWAP Pull Out Bays
Compatible with all 50 pin & 68 pin SCSI Buses up to Fast SCSI 2. From: $79.00

Teflon® External 90 Ohm SCSI Cables
From: $159
Features:
• Perfect 90 Ohm Impedance Match
• Triple Pronged Connector With Gold contacts

Custom Teflon® Int. Cables
Teflon® is a registered trademark of DuPont
From: $39
Benefits:
• Less Errors, Ultimate Performance
• Silver Wire Improves Signal Quality
Features:
• Perfect 90 Ohm Impedance • Custom in 1 Day
• Triple Pronged Connector - Gold contacts Silver Wire

Active 2-1 Switch/Repeater
From: $599
Benefits:
• Up to 14 Devices to 1 Computer
• Share Devices Between 2 Computers
Features:
• 2-1 Active Digital Switch/Repeater
• Regenerates SCSI Signal for Long Runs

Gold Diagnostic Adapters
Styles: Gender Changers
• Both 50 pin and 68 pin (all combinations)
Gender Changer
Styles: 68 pin Drive to 50 Bus
• 68 Pin Drive to 50 Pin IDC (runs wide drive as narrow)
Drive Bus Changer (run 68 pin on 50 pin bus)
Styles: 68 Pin Adapter Wide to 50 Pin Narrow
• 68 Pin External Adapter to 50 Pin (converts Host Adapter)
From: $49
68 Pin to 50 Pin Centronics or 50 Pin MicroD Adapters
Styles: For Adaptec Ultra Wide Cards
• Adapters with partial termination built in for 68 to 50 converters (converts Host Adapter)

68 Pin Internal Cables, custom or stock, from 1 to 15 SCSI devices per cable . We can also make Custom 68 pin and 50 pin Combination Cables that allow you to use narrow drives on a wide cable.

Cable Tester - LED Readout
This Digital SCSI Cable Tester can test all the popular cable styles for opens, shorts, and unreliable operation. Battery powered for easy use anywhere you need it. Three models to choose from:
• 50 pin Centronics
• 50 pin IDC
• 68 pin MicroD
From: $49

Active Digital SCSI Repeater
Power Supply Included
From: $139
Benefits:
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Computer Of The Month

Wedge's ShowBIZ-9000

The Wedge ShowBIZ-9000 is ideal for people who make presentations with an overhead projector. However, besides offering specialized features for this target audience, this computer would be an excellent choice for anyone looking for a powerful notebook computer.

This computer is comparatively hefty—weighing nearly 8lb. and measuring 12" x 10" x 2" including its lithium-ion battery. For most applications, I actually prefer these heavier computers. While they are not as convenient for typing on an airplane, they usually offer better keyboards and more features than their lighter counterparts.

In recognition of the growing obsolescence of the floppy drive, Wedge offers a great deal of flexibility on the ShowBIZ-9000. The floppy drive is removable and the bay that normally holds the drive can easily house the battery instead. Likewise, the second bay can hold either a CD-ROM drive or a battery pack. If you decide to install a battery in both bays, the floppy drive can work as an external drive. Additional lithium-ion batteries are available for $195.

The ShowBIZ-9000 is powered by a Pentium 233 with MMX. It comes standard with 40MB of RAM, which can be upgraded all the way up to 128MB. A number of hard drives are available, but the system I tested held 4GB.

The display is active matrix, but measures only 12" diagonally. The thinking behind this was that by limiting the size of the display they could hold down the size and weight of the computer. More importantly, they reasoned, this computer is customized for someone who wants to use it in conjunction with an overhead projector and will be viewing the notebook's display.

At first glance, this computer doesn't look that much different from

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System Special of the Month

Deluxe Tower Case / Power Supply
Intel® 300MHz Pentium™ II Processor – 512K L2
Intel® 440LX / 440BX Chipset on board
64MB RAM Memory Chips
Enhanced IDE HD/FD Controller
3 ½" internal Floppy Disk Drive
4.3 GB Internal IDE Hard Drive – UDMA
Matrox Productiva G100 with 8MB
Windows 95™ Enhanced Keyboard
PSII Logitech® Mouse with 2 buttons
32X E-IDE Internal CD-ROM Drive
16 Bit SoundBlaster Compatible Soundcard
100Watts PMPO Stereo Amplified Speakers
56K FAX, DATA and VOICE Internal Modem
Microsoft® Windows 95 or Windows 98 CD/Manuals
Grolier's Encyclopedia CD plus 6 Titles
15" MONITOR (0.28mm dot) – NI Flat Screen

$ 1,088.88

Intel® Pentium™ II 233MHz MMX™	$ 988.88
Intel® Pentium™ II 266MHz MMX™	$ 999.98
Intel® Pentium™ II 300MHz MMX™	$1,088.88
Intel® Pentium™ II 333MHz MMX™	$1,199.98
Intel® Pentium™ II 350MHz MMX™	$1,299.98
Intel® Pentium™ II 400MHz MMX™	$1,449.98

Monitors UPGRADE :
(with system purchase only)

17" Digital Control (1280X1024)	$ 100.00
17" DecaView G387 (0.25mm)	$ 175.00
17" DecaView GA387 (0.25mm)	$ 225.00
17" Relysis (1280X1028–0.26mm)	$ 225.00
19" Flat Screen, Digital - 0.26mm	$ 375.00

KCI Value HOME PC

Mini Tower Case / Power Supply
BIOSTAR Motherboard
Intel® 300MHz Pentium® II processor
Intel® 430TX / 440LX / 440BX Chipset
512K Pipe-line burst Cache Memory
64MB RAM Memory Chips
4 E-IDE HD and 2 FD Controller
2 Hi Speed Serial and 1 Parallel Port
6.4GB Ultra DMA Internal IDE Hard Drive
3.5" Floppy Disk Drive
DIAMOND® Stealth 2000 PRO 3D - 4MB
MPEG / Video CD Ready
Windows® 95 Enhanced 104 Keyboard
Logitech® Mouse - 2 buttons – Serial
56K Internal Fax/Data Modem
Internal 32X Internal CD-ROM
ESS® 16 Bit SoundBlaster Comp. Soundcard
100Watts PMPO Amplified Speakers
17" NI – SVGA Monitor - 0.28mm dot
Microsoft® Office 97 Professional CD
Microsoft® Windows 95 CD Software

$ 1,288.88

AMD® K6™ 200MHz with MMX™	$ 999.98
AMD® K6™ 233MHz with MMX™	$ 1,099.98
AMD® K6™ 300MHz with MMX™	$ 1,149.98
Cyrix® M2™ 200MHz with MMX™	$ 999.98
Cyrix® M2™ 233MHz with MMX™	$ 1,099.98
Cyrix® M2™ 300MHz with MMX™	$ 1,199.98
Intel® Pentium™ 200MHz MMX™	$ 1,079.98
Intel® Pentium™ 233MHz MMX™	$ 1,099.98
Intel® Pentium™ II 233MHz MMX™	$ 1,188.88
Intel® Pentium™ II 266MHz MMX™	$ 1,199.98
Intel® Pentium™ II 300MHz MMX™	$ 1,288.88
Intel® Pentium™ II 333MHz MMX™	$ 1,399.98
Intel® Pentium™ II 350MHz MMX™	$ 1,499.98
Intel® Pentium™ II 400MHz MMX™	$ 1,699.98

KCI – Starter PC SPECIALS

Deluxe Tower Case / 230W Power Supply
Cyrix® 6x86 – P200+ MHz processor
CPU Cooling Fan / heatsink
QDI® SpeedEasy™ Motherboard
Award® BIOS, 3 ISA, 4 PCI Slots
512K Pipe-line burst Cache Memory
32MB RAM Memory
2 HI Speed Serial and 1 Parallel Port
3.5" Internal 1.44MB Floppy Disk Drive
2GB Hard Drive – enhanced IDE
Super VGA Video Card – MPEG / Video CD
33.6K Fax and Data Modem
Windows® 95 Enhanced Key Keyboard
Logitech® Mouse - 2 buttons – Serial
24X Internal CD-ROM with Sound Card
15" Non-Interlaced Monitor 0.28mm dot
Microsoft® Windows 95 CD
Lotus® SmartSuite 97 CD includes :
Lotus® Organizer / Lotus® Freelance
Lotus® 123 / Lotus® WordPro
Lotus® Approach

$ 699.98

AMD® K6™ 200MHz with MMX™	$ 699.98
AMD® K6™ 233MHz with MMX™	$ 749.98
AMD® K6™ 300MHz with MMX™	$ 899.98
Cyrix® M2™ 200MHz with MMX™	$ 699.98
Cyrix® M2™ 233MHz with MMX™	$ 729.98
Cyrix® M2™ 300MHz with MMX™	$ 799.98
Intel® Pentium™ 200MHz MMX™	$ 688.88
Intel® Pentium™ 233MHz MMX™	$ 777.77
Intel® Pentium™ II 233MHz MMX™	$ 899.98
Intel® Pentium™ II 266MHz MMX™	$ 979.98
Intel® Pentium™ II 300MHz MMX™	$ 1,088.88
Intel® Pentium™ II 333MHz MMX™	$ 1,199.98
Intel® Pentium™ II 350MHz MMX™	$ 1,299.98
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IOMEGA® IDE ZIP Drive - Internal
Samsung® 3.5" Floppy Drive
4.3 GB Hard Drive – Ultra DMA
Diamond® Stealth 3D 2000 PRO 4MB Video Card
104 Keys Windows 95 Keyboard
Logitech® Mouse - 2 Buttons
56K Internal Fax/Data/Voice Modem
Creative® Internal DVD CD-ROM
Creative® MPEG2 Dxr2 Decoder
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Creative® SoundBlaster AWE64
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AMD® K6™ 300MHz with MMX™	$ 1,299.98
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Cyrix® M2™ 233MHz with MMX™	$ 1,149.98
Cyrix® M2™ 300MHz with MMX™	$ 1,199.98
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Intel® Pentium™ II 233MHz MMX™	$ 1,299.98
Intel® Pentium™ II 266MHz MMX™	$ 1,388.88
Intel® Pentium™ II 300MHz MMX™	$ 1,399.98
Intel® Pentium™ II 333MHz MMX™	$ 1,599.98
Intel® Pentium™ II 350MHz MMX™	$ 1,699.98
Intel® Pentium™ II 400MHz MMX™	$ 1,899.98

Peripherals on Sale

MEMORY MODULES

4X32 Fast Page or EDO - 16MB	$ 19.98
8X32 Fast page or EDO – 32MB	$ 29.98
4X64 SDRAM Module - 32MB	$ 29.98
8X64 SDRAM Module - 64MB	$ 79.98
16X64 SDRAM Module – 128MB	$ 169.98
32MB SDRAM 100MHz DIMM	$ 49.98
64MB SDRAM 100MHz DIMM	$ 99.98
128MB SDRAM 100MHz DIMM	$ 195.00

SCSI Controllers

16Bit ISA SCSI Card	$ 49.98
PCI version SCSI Card	$ 49.98
Adaptec® 2940UW – PCI	$ 179.98

Keyboards

Mitsumi® 104 Key - Windows 95	$ 9.98
Keytronic Keyboard - Windows 95	$ 25.00
Microsoft® Natural Keyboard	$ 59.98

Chassis

Minitower with 230W Power Supply	$ 19.98
Super Mini with 230Watts PS	$ 29.98
Deluxé ATX Tower Case / PS	$ 59.98

Monitors / Video

14" Non-Interlaced 0.28mm dot	$ 129.98
15" Non-Interlaced - Digital Controls	$ 149.98
17" NI 1280X1024 - Digital Controls	$ 239.98
Zoltrix Video Capture / TV Tuner	$ 89.98

GREAT DEALS OF THE MONTH

Hard Drives	
3.2GB Ultra DMA IDE Hard Drive	$ 139.98
4.3GB Ultra DMA IDE Hard Drive	$ 149.98
6.4GB UDMA IDE Hard Drive	$ 199.98
2.1GB SCSI Hard Drive – 7200 rpm	$ 199.98
Modems	
56K Int. Fax/Data/Voice Modem	$ 39.98
Rockwell® 33.6K Fax / Data Modem	$ 39.98
Multimedia / Video	
Internal 32X IDE CD-ROM	$ 59.98
S3® Virge 3D with 4MB EDO Video	$ 44.98
SiS® 4MB AGP Video Card	**$ 39.98**
ATI® All In Wonder PRO with 4MB	$ 199.98
Matrox® Millennium II with 4MB AGP	$ 129.98
ESS® 1869 Sound Card / Speakers	$ 19.98
Creative® Value AWE64 CD Kit	$ 169.98
Creative® SoundBlaster AWE 64	$ 69.98
Motherboards / Processors	
BIOSTAR® Pentium II 440LX series	$ 99.98
With Intel® PII - 233MHz Processor	$ 299.98
BIOSTAR® 430TX – 512K PLC MB	$ 69.98
With Intel® Pentium 233MHz MMX	$ 199.98
BIOSTAR® Pentium II 440BX Series	$ 129.98
With Intel® PII - 300MHz Processor	$ 425.00
NETWORK	
32Bit PCI Ethernet Cards 10 / 100	$ 29.98

Peripherals on Sale

Motherboards

BIOSTAR® TLC Pentium II MB	$ 125.00
BIOSTAR® 8500TTD – 512K PL Cache	$89.98
QDI® 430VX Explorer II SpeedEasy	$ 99.98
QDI® Titanium - 512K – 430TX	$ 109.00
QDI® Natoma Pentium Pro	$ 175.00
ASUS® TX97e - 512K PLC	$ 135.00
ASUS® P2L97 Pentium II Motherboard	$ 149.98
ASUS® P2L97-S Pentium II – SCSI	$ 249.98
ASUS® P2L97-DS Pentium II - Dual	$ 399.98

Video Cards

ATI® Video Cards	Call
Diamond Fire Pro 1000 – 4MB AGP	$ 119.98
Diamond® Viper Pro 330 – 4MB	$ 89.98
Diamond® Stealth 3D 2000 PRO	$ 49.98
Matrox® Millennium II – 4MB WRAM	$ 119.98

Modems

Diamond® Supra PCI Fax & Data 56K	$ 59.98
Zoltrix® Rockwell® Fax & Data 56K	$ 49.98
Zoltrix® HSP KFLEX 56K F/D/Voice	$ 39.98
US Robotics Sportster F/D/V 33.6K	$ 75.00
US Robotics Sportster F/D 56K	$ 109.98

CDROMS / Multimedia

Toshiba 32X Internal IDE CD-ROM	$ 69.98
24X Internal IDE CD-ROM	$ 55.00
Creative DVD Kit	$ 279.98

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SUNDAY : 11AM-6PM

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any other comparably sized laptop. But the display is totally unique. When you open the top, the display is conventional in appearance. The difference, however, is that the outside of the display—in other words, the case of the computer—lifts off so that you can see through the membrane that is the display. When you remove this backing, the display bends back 180 degrees and can be set on an overhead projector.

Wedge provides all the accessories to make this computer work efficiently as a display unit. In addition to the unique design of the display, you also get a collapsible platform to hold the computer and an infrared remote for controlling the computer from a distance. While the remote does not have a keyboard, the programmable buttons are designed to work with most slide presentation packages. In addition, the remote has a laser pointer that lets you point out features on the projected image. All in all, this is a well thought out system.

If you want to use an external monitor, you simply connect through the port on the side of the computer. The built-in display supports Super VGA resolution. The ShowBIZ-9000 also has provisions for displaying on a TV screen and for having TV output show on the computer screen. Of course, there are all of the normal multimedia features including a 20X CD-ROM drive, microphone, and ports for line-in and speakers. The built-in speakers are a cut above the normal as there are provisions for bass as well as normal sound ranges.

There are two USB ports and two PC Card slots. The lower of the PC Card slots is set up for Zoomed Video. A high-speed infrared port is included for wireless transfers to other similarly equipped computers or peripherals.

While this is a specialized computer, it does its primary job well enough so that it makes sense for anyone who wants a notebook and can utilize these other features from time to time. Wedge has wisely not designed a system that is so specialized that it will only appeal to people who want it for its unique feature.

The ShowBIZ-9000 is a well designed computer that comes with all you will need for making presentations. A generous carrying case comes standard and holds the computer, remote control, portable stand, and all of the cables and disks you may need. If you have dreamed of a computer that could take the place of transparencies, this is the system for you. ◆

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At first glance, this computer doesn't look that much different from any other comparably sized laptop. But the display is totally unique.

Resources:

ShowBIZ-9000, $3995
Wedge Technology, Inc.
1657 McCandless Dr.
Milpitas, CA 95035
(408)263-9888

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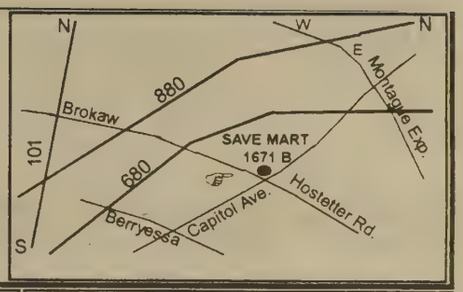

PENTIUM II BX SYSTEMS

* Intel Seattle 440BX Mboard or Asus P2B98-440BX Mboard w/ Accelerated Graphics Port.
* 512k L2 Pipelined Burst
* 64 MB SDRAM PC100
* Teac 1 44 Floppy Dnve
* Fujitsu 6 4GB Ultra DMA
* EIDE PCI built-in I/O 16550
* ATI Xpert @Work AGP 8MB
* ATX Medium Tower 250W
* KeytronicWin95 keyboard
* Microsoft PS2 IntelliMouse
* Toshiba 32x CD-ROM
* PCI Audio Stereo Sound
* Yamaha M7 speakers
* US Robotics 56K FaxModem
* Free Power Surge & CPU fan
* Window 98 CD & Manual
* Impression 7plus .27 17"

Pentium®II Processor	
400MHz MMX	$1980
350MHz MMX	1780
333MHz MMX	1680
300MHz MMX	1580

PENTIUM II LX SYSTEMS

* Intel Atlanta 440LX Mboard orAsus P2L97-440LX Mboard w/ Accelerated Graphics Port.
* 512k L2 Pipelined Burst
* 64 MB SDRAM 10ns
* Teac 1.44 Floppy Drive
* Fujitsu 4.30 GB Ultra DMA
* EIDE PCI built-in I/O 16550
* ATI Xpert @Work AGP 8MB
* ATX Medium Tower 250W
* Mitsumi Win95 keyboard
* Logitech PS2 mouse
* Toshiba 32x CD-ROM
* Yamaha Stereo Sound
* Yamaha M7 speakers
* US Robotics 56K FaxModem
* Free Power Surge & CPU fan
* Window 98 CD & Manual
* Impression 7plus .27 17"

Pentium®II Processor	
333MHz MMX	$1570
300MHz MMX	1470
266MHz MMX	1370
233MHz MMX	1340

ANCHORAGE SYSTEMS

* Intel Anchorage TX PCI Motherboard
* 512k L2 Pipelined Burst
* 32-MB SDRAM 10ns
* Teac 1 44 Floppy Dnve
* Fujitsu 4.30 GB Ultra DMA
* EIDE PCI built-in I/O 16550
* Diamond Fire Pro 1000 4MB
* ATX Medium Tower 250W
* Mitsumi Win95 keyboard
* Logitech PS2 mouse
* Toshiba 24x CD-ROM
* Yamaha Stereo Sound
* 180 watt speakers
* 56k Fax Modem w/ voice
* Free Power Surge
* Window 98 CD & Manual
* Impression 5plus .28 15"

Pentium® Processor	
233MHz MMX	$1126
200MHz MMX	1095
166MHz MMX	1088
133MHz MMX	1058

ASUS TX97 SYSTEMS

* Asus Triton TX97 Mboard
* 512k L2 Pipelined Burst
* 32 MB EDO RAM
* Teac 1.44 Floppy Drive
* 4 30 GB EIDE Ultra DMA
* EIDE PCI built-in I/O 16550
* ATI Xpert @ Work PCI 4MB
* ATX Medium Tower 250W
* Mitsumi Win95 keyboard
* Logitech PS2 mouse
* Toshiba 24x CD-ROM
* Yamaha Stereo Sound
* 180 watt speakers
* 56k Fax Modem w/ voice
* Free Power Surge
* Window 98 CD & Manual
* Impression 5plus .28 15"

Pentium® Processor	
233MHz MMX	$1099
200MHz MMX	1070
AMD K6 Processor	
233MHz MMX	1049
200MHz MMX	1036

BEST BUY SYSTEMS

* Tnton TX PCI Motherboard
* 512k L2 Pipelined Burst
* 32 MB SDRAM 10ns
* Teac 1 44 Floppy Dnve
* 2 60 GB EIDE Ultra DMA
* EIDE PCI built-in I/O 16550
* S3 PCI video card 2mb
* Mini Tower 250Watt
* Mitsumi Win95 keyboard
* Logitech PS2 mouse
* Toshiba 24x CD-ROM
* Yamaha Stereo Sound
* 120 watt speakers
* 33 6 Fax Modem
* Free Power Surge & CPU fan
* Window 98 CD & Manual
* MGC .28 14" Monitor

Pentium® Processor	
233MHz MMX	$818
200MHz MMX	787
AMD K6 Processor	
233MHz MMX	766
200MHz MMX	753

Special Systems

PENTIUM II 266 MHz MMX 32X MULTIMEDIA SYSTEM

* **Intel Atlanta 440LX MB (Intel MB)**
* **512k L2 Pipelined Burst**
* **64 MB SDRAM 10ns**
* **Teac 1.44 Floppy Drive**
* **4.30GB EIDE Ultra DMA**
* **EIDE PCI built-in I/O 16550**
* **ATI Xpert @Work AGP 8MB**
* **ATX Medium Tower 250W**
* **Mitsumi Win95 PS2 keyboard**
* **Net PS2 mouse**
* **Toshiba 32x CD-ROM**
* **Yamaha Stereo Sound**
* **180 watt speakers**
* **56k Fax Modem w/ voice**
* **Free Power Surge & CPU fan**
* **Window 98 CD & Manual**
* **Impression 5 plus 15" monitor**

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Pentium II 266 MHz	$1230
Pentium II 300 MHz	$1312
Pentium II 333 MHz	$1412
Pentium II 350 MHz	$1552
Pentium II 400 MHz	$1752

(Pentium II 350 & 400 use Seattle MB)

MotherBoard + CPU	
Intel Seattle SE440BX Pen II 400	909
Intel Seattle SE440BX Pen II 350	575
Intel Seattle SE440BX Pen II 333	609
Intel Seattle SE440BX Pen II 300	510
Intel Seattle SE440BX Pen II 266	412
Intel Seattle SE440BX Pen II 233	375
Intel Atlanta AL440LX Pen II 333	569
Intel Atlanta AL440LX Pen II 300	470
Intel Atlanta AL440LX Pen II 266	362
Intel Atlanta AL440LX Pen II 233	335
Asus P2B98-440BX Pen II 400	884
Asus P2B98-440BX Pen II 350	685
Asus P2L97-440LX Pen II 333	584
Asus P2L97-440LX Pen II 300	484
Asus P2L97-440LX Pen II 266	376
Asus P2L97-440LX Pen II 233	350
Intel Venus+Pentium Pro 180MHz	235
Intel AN430TX P-233 MMX/512	255
Intel AN430TX P-200 MMX/512	245
Asus TX97 P-233 MMX/512	240
Asus TX97 P-200 MMX/512	235
AMD K6-233 + Asus TX97/512	204
Triton TX + P-233 MMX/512	205
Triton TX + P-200 MMX/512	195

Special Sales this month:

* **Pentium II 233 MMX w/ Atlanta AGP 512 K ...$325**
* **Pentium 233 MMX w/ Triton TX PCI 512 K ... $199**
* **ATI Xpert@work PCI 8MB video card only $99**
* **32 MB EDO MEMORY 60ns (brand name) $30**
* **Toshiba 24X EIDE CD-ROM $55**
* **ATX mid tower case 250 watt P.S. $49**

72 PINS MEMORY

8 MB 60ns 72 PIN EDO (16 chip)	15
16 MB 60ns 72 PIN EDO (8 chip)	20
16 MB 60ns w/ parity (12 chip)	25
32 MB 60ns (8x32) EDO	40
64 MB 60ns (16x31) EDO	90

30 PINS MEMORY

1 MB 60/70/80ns 30 PIN (1x3)	3
4 MB 60/70ns 30 PIN	15

SDRAM w/ EEPROM

32 MB SDRAM 10ns (4x64)	40
64 MB SDRAM 10ns (8x64)	80
128 MB SDRAM 10ns (16x64)	175

KEYBOARDS

104 Win95 keys/Mitsumi 104	13
Keytronic Win95/PS2	25
Focus 2001/Focus7200 + Trackball	28/35

MISCELLANEOUS

NetMouse PS2	12
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G3 PowerBook

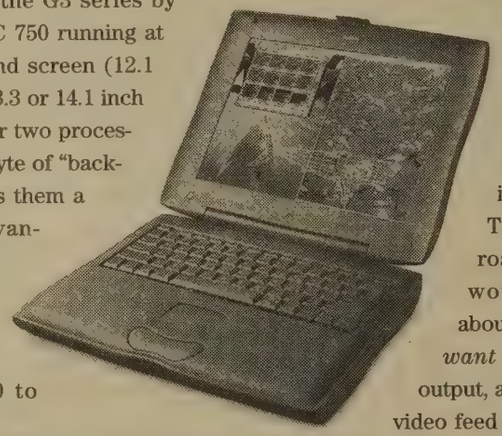
The Only Macintosh You'll Ever Need?

By Sam Penrose

The PowerBook's final outstanding "feature" may seem obvious, but it matters: this is a Mac. Setting up an AppleTalk network to transfer my files from my desktop took 90 seconds.

Some say Apple's new PowerBook G3 Series are the first portable computers good enough to replace desktop Macintoshes. After using one for two days, I agree that it's hard to imagine a better laptop—but the laptop form factor has inherent problems, and good laptops still cost serious money.

Apple differentiates the G3 series by processor (the PowerPC 750 running at 233, 250, or 292MHz) and screen (12.1 inch passive matrix or 13.3 or 14.1 inch active matrix). The faster two processors come with a megabyte of "backside" cache, which gives them a huge performance advantage over the cacheless 233MHz model and all Windows notebooks. Prices range from just over $2,000 to nearly $6,000.



I used a 233MHz model with the 13.3 inch active matrix screen, list price $3,000. All models ship with internal CD-ROM drives and Ethernet; most have floppies and 56K modems, and you can trade up to a DVD-ROM or add a third-party Zip drive if you want. Customers who buy direct from Apple can configure their own unit.

A Feast For The Senses

Big active matrix displays are the outstanding feature of today's high-end laptops. With my desktop Mac, I normally use a 17" Trinitron monitor at a WYSIWYG resolution of 832 x 624. The PowerBook G3's 13.3 inch active matrix display has a fixed resolution of 1024 x 768. Despite packing 50% more pixels into a smaller area, the PowerBook screen is as easy to read as the Trinitron, and shows more information faster in 24-bit color, thanks to the accelerated graphics system inside.

The screen comfortably displays two pages side-by-side, a real productivity enhancement with word processors, spreadsheets, or page layout programs. At about $600 more than the outdated entry-level 12.1"/800 x 600 pixel passive matrix LCD, the 13.3 inch TFT is one feature worth busting your budget for.

Off-black hues, curvy lines, and broad (12.7" x 10.4") but surprisingly thin (2") dimensions give the new machines a distinct physical presence. They weigh between 7 and 8 pounds.

The PowerBook G3 sounds as good as it looks. With *Bach Cello Suites* in the CD player, the internal speakers bring out Rostropovich's breathing from behind his bowing. The fan's muted jet-engine roar is not unpleasant, but it would make me think twice about working in a library. If you *want* to be noticed, 16-bit sound output, an SVGA connector and an S-video feed will help you get your point across to a big audience.

A Mercedes Or A Porsche?

The PowerBook's benchmark test results are sky-high. Real world performance varies from stunning to unremarkable, depending on how much time the processor spends waiting, especially for the hard drive.

PowerBook buyers will do well to pick up a 64MB SO-SDRAM DIMM (under $150 from vendors who specialize in RAM). Once it's installed, turning off virtual memory and quadrupling the "disk cache" in your PowerBook's Memory Control Panel should result in noticeably improved responsiveness, while leaving plenty of RAM for applications. Also consider increasing the RAM partition of memory-sensitive applications like Web browsers by selecting the program's icon in the Finder, choosing the Get Info command, and increasing the figure in the "preferred size" field. Internet Explorer loaded pages twice as quickly after I tripled its partition to 16 megabytes.

The backside cache in the 250 and 292MHz

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models will speed things up across the board, particularly in applications like VirtualPC that depend heavily on a small set of instructions.

Two Caveats

The keyboard has a pleasant action, better than that of some cheap desktop keyboards. Unfortunately, the keys don't work well unless struck vertically, which forced me to place the keyboard at an ergonomically correct waist height, which in turn brought the screen right in front of my chest. This is an inherent problem with the laptop form factor.

I'm writing this column with the screen at a proper height on my desk, an external keyboard sitting on my lap, and a mouse nearby: a clumsy if effective solution.

To be fair, some people happily work all day on laptops. If you've never used a portable, try borrowing one to see how you adjust.

Computer users also vary in their budgets. As impressive as this PowerBook is, it would not have delivered the same experience without the big active matrix display. The bar is thus set at $3,000 for those who want a compelling product; $4,000 for a backside cache-packing screamer.

Street prices are close to those of comparably-featured Dell and Gateway laptops, suggesting that this is a problem with the underlying technology rather than Apple's implementation. But it's still a problem.

Vive Le Difference

The PowerBook's final outstanding "feature" may seem obvious, but it matters: this is a Mac. Setting up an AppleTalk network to transfer my files from my desktop took 90 seconds and required only the system software installed on both machines at the factory and a $6 cable that came with my printer.

I felt free to monkey around with a friend's $3,000 computer because in the unlikely event of a system corruption, I could pop in the CD that came with the PowerBook and restore it from scratch in under 15 minutes. Windows doesn't ship with such a CD, and if it did most PC boxes couldn't use it, and most users wouldn't know how to make one work even if their machine's BIOS supported booting from a CD. That counts in the real world. If I'd had to worry about hosing my friend's DLLs, I wouldn't have been able to write this review.

Thanks to BMUGer and lead Quality Assurance engineer for Connectix' Virtual PC John Malm for contributions to this review. Feedback welcome at *MicroTimes_Column@bmug.org.* ◆

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Online Resources:

Get detailed product information at:
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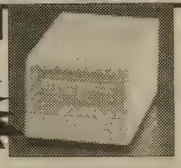

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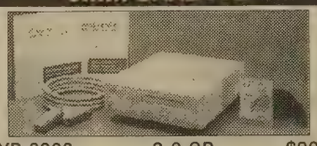

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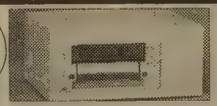

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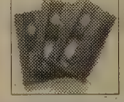

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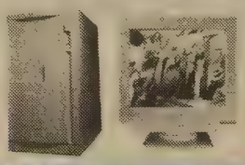

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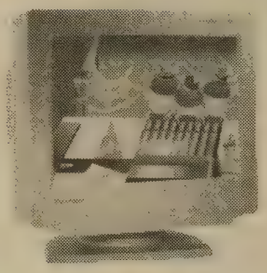

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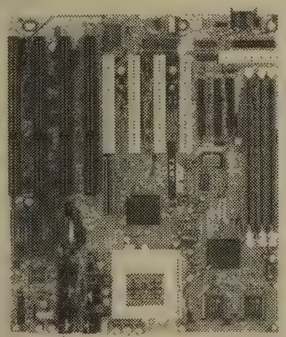

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POs

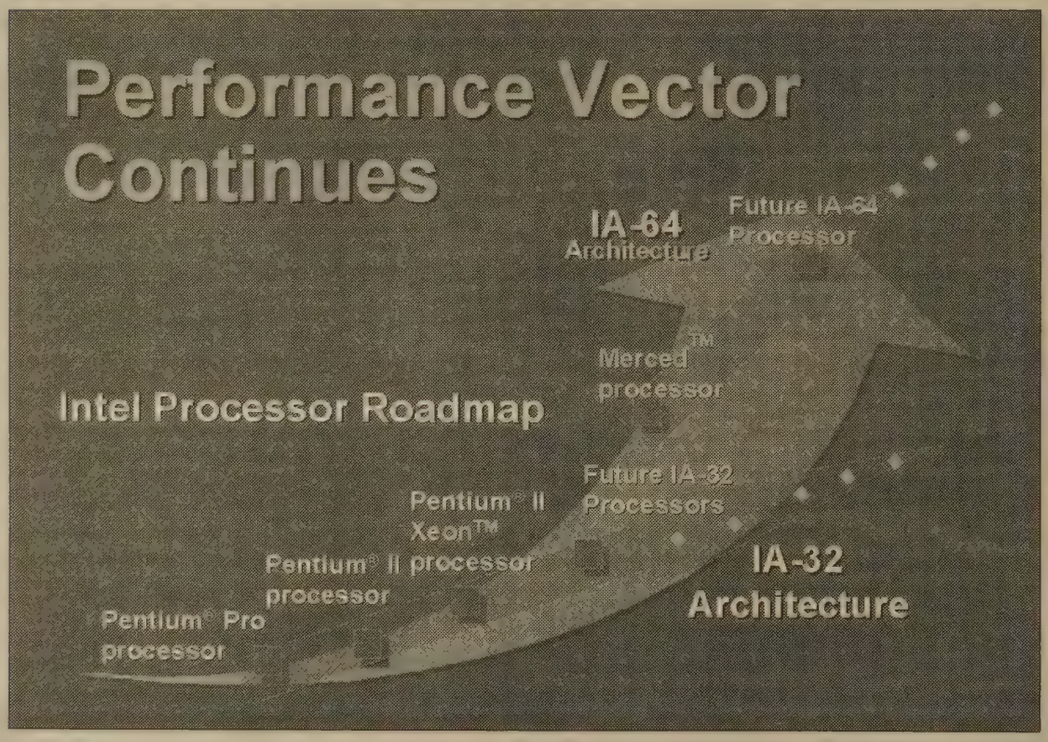
Intel Launches PII Xeon

Performance Boost For High-End Workstations And Servers

By Mary Eisenhart

Xeon is positioned as the successor to the Pentium Pro. It features 400MHz processor speed at introduction, along with a 100MHz system bus.

Intel's recent announcement of the 32-bit Pentium II Xeon processor line defined the next step in its roadmap for the high-end server and workstation market. Though the average desktop PC user is little affected by the advent of the new CPU, its hefty price tag (starting at around $1000 for OEMs and climbing rapidly with high clock speeds and larger caches) will be justified by performance increases in some more demanding situations.



Source: Intel

Optimized for multiprocessor systems and endowed with a larger L2 cache, the Xeon line is ideal for heavy transaction processing, CAD, graphics, and other calculation-intensive applications.

Xeon is a key component in Intel's strategy to increase market share in the high-end computing world presently dominated by RISC-based systems, particularly Sun's. Various UNIXes including Solaris are available for Xeon-based systems, in addition to Windows NT.

Announced June 29, Xeon is positioned as the successor to the Pentium Pro. It features 400MHz processor speed at introduction, along with a 100MHz system bus. Versions of the chip varying by speed and cache size will become available through the rest of the year.

The Level 2 cache and improved scalability of the Xeon over its predecessor result in better performance in situations where large amounts of data exceed the on-chip cache and therefore move to the L2. Michael Slater of MicroDesign Resources (*www.chipanalyst.com/q/@5244220qtpsym/analysts/michael/*), executive editor of *Microprocessor Report*, explains that the advantages are most notable in multiprocessor server configurations: "The larger cache has an additional level of benefit in that it reduces the amount of time the processor module accesses the bus, because it more frequently finds what it needs in the cache. As you add processors, performance scales more rapidly."

As to what issues should govern the decision to spend the extra money on Xeon instead of PII, Slater emphasizes that Xeon is not a consumer product and never will be. Instead, he says, "spending an extra $1,000 for an even modest performance boost can be justified in high-end system—when you're dealing with a $100K system, paying an extra $1,000 for perhaps a 10% performance increase makes sense." Transaction processing, which, he says, makes good use of a big fast cache, is a typical application where the performance improvement would be worth the price.

The Xeon line is the most recent stage on the IA-32 side of Intel's processor roadmap (see diagram). As the 32-bit line continues to be developed in future years, it will be supplemented by the 64-bit IA-64 line, beginning with Merced. With the recent announcement that Merced's arrival would be delayed until next year, Xeon represents Intel's top of the line for the short-term future. ◆

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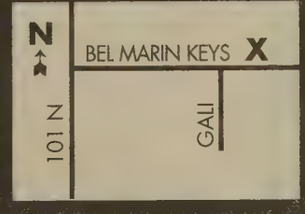

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Internet Telephony

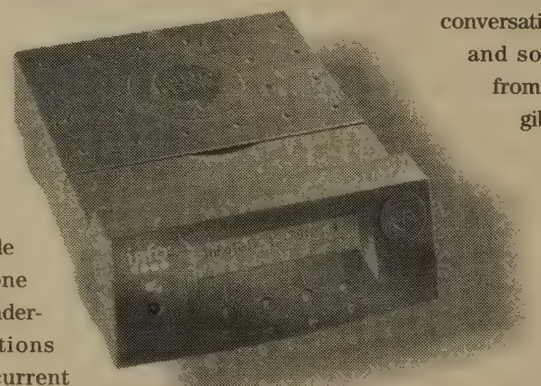
The Past, Present, And The Promise

By Ken Fermoyle

The technology still isn't fully ready for prime time in most business environments. But it's getting closer every day.

Recent developments (e.g., mergers, Sprint's Integrated On-Demand Network) make it clear that computers, the Net, and telephones are converging rapidly, but what about Internet telephony? As it emerges from infancy to the toddler stage, Net phone technology faces a future with tremendous promise, but potentially serious problems. Will the latter stunt its growth, or will it flourish as a child prodigy and robust adult?

A lot of savvy analysts and business titans prophesy that telephony using Internet Protocol (IP Telephony) not only faces a prodigious childhood but could become a Goliath that eventually overshadows conventional telephony. Even naysayers agree that the technology has an excellent shot at long-term success, but add that it faces severe growing pains. These include efforts by traditional phone companies to keep it an undernourished communications stepchild (see sidebar), current Internet bandwidth restrictions, lack of product interoperability between vendors, and a clouded future on the political front.



InfoTalk is a Net telephony device that does not require a PC to work.

The Past: For Hobbyists Only

Software-only products were the first that allowed hardcore users to make free long-distance phone calls via the Internet, circa 1996. Among the drawbacks: both parties had to be online at a prearranged time to hook up successfully, and sound quality was poor. There were time delays, often lengthy ones, as the conversation was routed through servers and switches and over lines of varying quality. Each user also had to have a sound card (preferably full-duplex), plus speakers and microphone (or headphones).

I first tried making long-distance phone calls via the Net in early 1997 when my ISP, Earthlink, called my attention to VocalTec's Internet Phone software, and provided detailed how-to directions in its online Tech Tips section. Downloading and installing it wasn't difficult, but did require some knowledge: SMTP Server designation, modem speed, etc.

As a novelty, the results were fine—but it was hardly worth the bother to save a buck or two. Making each of the several calls I tried required a flurry of emails to make sure we all had current copies of the software. Then we had to arrive at a mutually agreeable time to meet online for our cyberspace conversations. As I had been warned, time delays in the conversations were a nuisance, and sound quality ranged from fair to barely intelligible at times.

One of the calls was to a friend with an older system (486, with 14.4 modem and half-duplex sound card), which didn't help. We got in about two minutes of understandable talk during the six-minute call. The half-duplex sound card was a stumbling block. It works like a walkie-talkie; one person talks, then turns the conversation over to the other caller. (One benefit: no interruptions while you're talking!).

I concluded that I would take a pass on more phone calls over the Net until things improved. I could not see any viable business use for the technology as it then existed, and I could make personal calls in off-hours or on weekends so inexpensively that Net phoning wasn't worth the hassle.

The Present: Rapid Growth Spurts

About a year passed, and new products appeared. So I began scoping out the current state of the art, discovering that improved software and new

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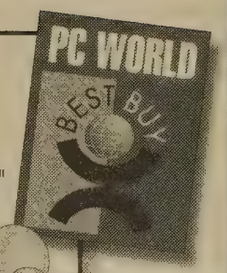

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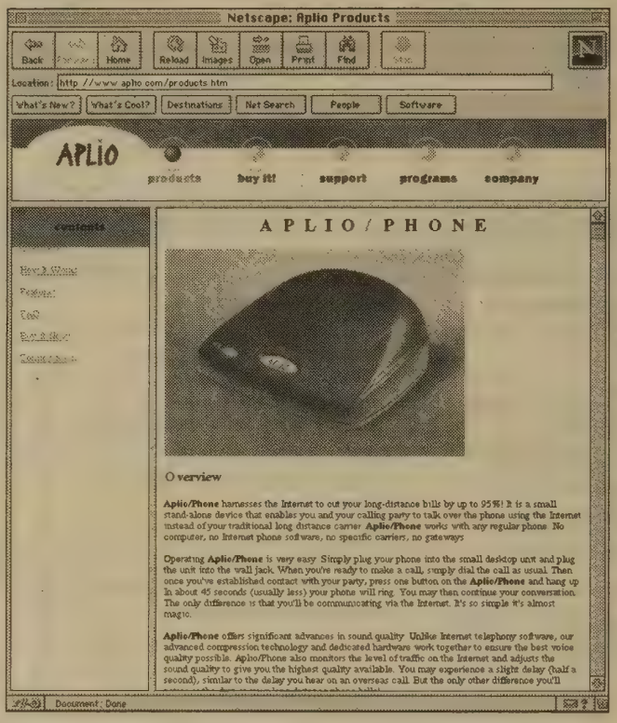
hardware claimed to solve many of the earlier problems. I acquired some samples to check their effectiveness.

There is good news, and semi-good news. The good news is that the new hardware and software *do* improve Net phone calls, with the convenience factor somewhat improved. The semi-good news is that the technology still isn't fully ready for prime time in most business environments. But it's a lot closer than it was, and getting closer every day. It definitely is moving out of the hobbyist-only stage at a rapid rate of knots.

The hardware I checked included Internet PhoneJACK, InfoTalk, and Aplio/Phone, all different but representative of currently available Net phone equipment. Software used included the latest version of VocalTecs Internet Phone, Microsoft's Net Meeting, and IDT's Net2Phone. These were not objective, scientific tests, understand; just quick, subjective trials to see how the results compared with my earlier software-only Net phone calls and with those I make every day using conventional phone service.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Overview
Aplio/Phone harnesses the Internet to cut your long-distance bills by up to 95%! It is a small stand-alone device that enables you and your calling party to talk over the phone using the Internet instead of your traditional long distance carrier. Aplio/Phone works with any regular phone. No computer, no Internet phone software, no specific carriers, no gateways
Operating Aplio/Phone is very easy. Simply plug your phone into the small desktop unit and plug the unit into the wall jack. When you're ready to make a call, simply dial the call as usual. Then once you've established contact with your party, press one button on the Aplio/Phone and hang up. In about 45 seconds (usually less) your phone will ring. You may then continue your conversation. The only difference is that you'll be communicating via the Internet. It's so simple it's almost magic.
Aplio/Phone offers significant advances in sound quality. Unlike Internet telephony software, our advanced compression technology and dedicated hardware work together to ensure the best voice quality possible. Aplio/Phone also monitors the level of traffic on the Internet and adjusts the sound quality to give you the highest quality available. You may experience a slight delay (half a second), similar to the delay you hear on an overseas call. But the only other difference you'll
Document: Done

Aplio/Phone is a standalone that allows voice communication through the Internet without a PC or gateway service.

Hardware Solutions Vary

PhoneJACK is a Plug-and-Play DSP (digital signal processing) card that plugs into an ISA slot (half or full). It works alongside, but independently of, existing sound cards. It doesn't need a modem, and—wonder of wonders!—does not require one of your precious IRQs, simplifying installation. It includes an RJ-11 POTS (Plain Old Telephone Service) port, RJ-12 headset port and 3.5mm connections for microphone and speaker. Its hardware-based compression technology reduces delay and CPU load on your system.

You can connect a standard phone to the PhoneJACK card and enjoy sound quality rivaling that of conventional phone calls. It's ideal if there is another PhoneJACK on the other end of the call, but that's not necessary. Even if the other party is only using such software as NetMeeting or Net2Phone, both parties benefit from PhoneJACK's better sound.

InfoTalk and Aplio/Phone, Net telephony devices from InnoMedia and Aplio, Inc., differ markedly from PhoneJACK in that they do not require a PC to work. Both plug in between a conventional phone and POTS wall outlet, serving as a mini-gateways to the Net. Their major drawback is that they use proprietary technologies, so parties on both ends of a phone call must use the same products. An InfoTalk phone cannot talk to an Aplio/Phone, or to any other IP Telephony device.

InfoTalk is based on a patent-pending technology that uses unique multiple compression algorithms, according to developer InnoMedia. It did reduce time lags noticeably, especially in comparison with software-only IP Telephony products. InfoTalk is software-upgradeable and includes a built-in modem, 2-line by 20-character LCD display, an RJ-11 line connector and an RJ-11 telephone connector.

To make a call, you dial the number normally. When the call is answered, you tell the other party you want to make this an Internet call. (Remember, both of you must have InfoTalk devices installed properly.) Either the caller or callee can then press the pound (#) key to initiate the Internet connection. When the connection is established, you can begin the conversation. If your ISP is busy, InfoTalk automatically redials the number.

Aplio/Phone, like InfoTalk, is a standalone that allows voice communication through the Internet without a PC or gateway service. To make a call, you dial the other party as usual. When a connection is made to the other Aplio/Phone, either party can press the "Aplio" button on the device to switch the call from the long-distance carrier to the Internet. Both parties then hang up; in about 45 seconds or less, the phones ring and callers can converse as usual. Only they're doing it on the Internet, not with AT&T's or MCI's meter running.

Telcos Attempt To Stunt Growth Of Internet Telephony

They say they want to level the playing field, but traditional phone companies' attacks on Net telephony look more like efforts to stifle competition before it gets a foothold. At least that's how it looks to many industry analysts, including this admittedly biased observer.

Preemptive strikes began in March, 1996 when a lobbying group, America's Carriers Telecommunications Association (ACTA), petitioned the Federal Communications Commission (FCC) to start regulating Internet telephony. At that time, remember, using the Net for phone calls had so many drawbacks that it attracted only hobbyists and hardcore techies. Even now, best estimates place the Net phone user base at just 100,000 to 200,000 people.

ACTA argued that Net telephony, then still in prenatal stage, was getting a free ride and should be subject to all the same regulations and access fees as the giant telcos. The FCC vetoed the idea after receiving a storm of protest, so Net telephony remained unregulated.

Now telcos have mounted new attacks. They want to force their Net competitors, hardly a realistic description at this point, to pay into the federal Universal Service Fund. The Fund subsidizes phone service for rural areas and the poor, and helps wire schools and libraries to the Internet. ACTA claims that telco contributions to the Fund are, in effect, subsidizing the competition, a dubious argument. How much long-distance business will poor or rural callers and libraries or schools generate?

The other, more subtle attack came when AT&T reneged on a promise to Congress that it would not pass along cost of the school and library Internet wiring subsidy to customers. It now plans to jack up interstate long-distance bills by 5% beginning July 1. MCI went AT&T one better, announcing a 5.9% increase. This brought heated reaction from customers. Congress responded by threatening to pull the plug on the wiring program, which many industry observers suspect was exactly the reaction that telcos wanted.

Even its staunchest advocates do not propose that Net telephony remain exempt from FCC regulations and fees indefinitely. It's just the timing, says Jeff Pulver, chair of Voice On the Net (VON) Coalition. Pulver and VON believe that Net phone service needs another two or three years of regulation-free nurturing to develop. Assessing fees now might curtail investments needed to help it become established. Pulver also feels the FCC might consider alternate ways for Net phone companies to pursue the goal of universal service. —*K.F.*

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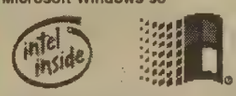

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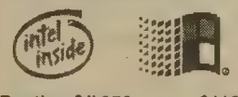

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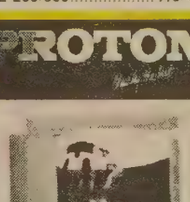

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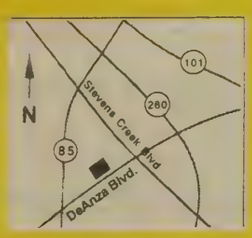

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That's the current state of the art. The three approaches—software only, DSP cards, and standalone devices—have drawbacks, but I lean toward the PhoneJACK as the best solution for my purposes at this point.

All hardware IP Telephony products have one thing in common, however. They're pricey, from about $200 to $300, compared to standard phone instruments that now go for as low as $20. How many long-distance calls will it take to amortize the cost of a Net phone, especially if you have to supply the devices to some of the people you call regularly?

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The lack of interoperability looms as an immediate threat to IP Telephony, and not just at the desktop or PC-based hardware level. I suspect technology can overcome the time lags, bandwidth shortages (DSL, cable, whatever?), and inconveniences of placing calls. The strides made in just two years prove that is not only possible, but probable.

The interoperability situation is reminiscent of the bad old days (late 1970s, early 1980s) of proprietary operating systems, including CP/M and

Internet Telephony Glossary

Access Charge. Fee charged subscribers or other telephone companies by a local exchange carrier for the use of its local exchange network facilities

ACTA. America's Carriers Telecommunications Association; trade lobbying group for traditional telephone companies.

ATM. Asynchronous Transfer Mode; form of data transmission based on fixed-length packets, or cells, that carry data, voice and video. This technology combines benefits of circuit switching and packet switching.

Circuit Switching. Method used in conventional telephone systems; when a call is placed and answered, a circuit opens. The circuit remains open as long as the call lasts, so no other call can use that line.

Internet Protocol, or IP. The address or routing mechanism used on the Internet (see TCP/IP).

ITU. International Telecommunication Union; international organization that develops communication standards.

Modem. Modulator/demodulator; communication device that converts (modulates) computer data from digital to analog form so it can be carried over standard telephone lines. Another modem is needed at the destination to convert (demodulate) the data back to digital form.

Packet Switching. Method used to move data on the Internet; data is broken up into small packets which co-mingle on the same line. Packets contains identifiers, address of where it came from and where its going, so they can be sorted, routed and reassembled at the delivery point. When a packet is corrupted by line noise or lost, a duplicate packet is sent.

TCP/IP. Transmission Control Protocol/Internet Protocol; a well-defined set of rules that govern how computers communicate with each other over the Internet.

Transmission Control Protocol, or TCP. Rules that control the transfer of data over the Internet (see TCP/IP).

Telco (plural: Telcos). Telephone company; usually reserved for large traditional carriers:

VoIP. Voice over IP; telephone (voice) service using the Internet Protocol.

VON. Voice Over Net; similar to VoIP.

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AMD K6 233MHz MMX..... $469

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DOS. Microcomputers could not talk to each other any more than an InfoTalk can to an Aplio/Phone. It wasn't until standardized operating systems came along that micros began selling in respectable quantities (although the numbers were still minute compared to sales today).

I doubt that lack of standards will continue too long, however. Some corporations already use their WANs (Wide Area Networks) for communications via TCP/IP, using the new Voice Over Internet Protocol (VOIP). The audio quality has been likened to that of cell phones, which is good enough for this purpose. And the savings in here can be significant.

We also have the H.323 standard, which defines a common set of compression/decompression algorithms. Pushed by such biggies as Intel and Microsoft, H.323 is gradually being accepted by IP Telephony vendors. Its champions say it will do for Internet telephony what SMTP (Simple Mail Transfer Protocol) has done for email.

Beyond the desktop, large-scale projects, mergers, and cooperative efforts announced even as this article was being researched and written indicate how seriously some big movers and shakers in the broad telecom field regard Internet telephony.

Item: Sprint announces its $2 billion Integrated On-Demand Network (ION), which will use the Internet's packet-switching technology (as opposed to the traditional circuit-switched conventional telco networks) for voice, fax, and Internet connections. Sprint claims ION could reduce long-distance call costs by as much as 70% and allow Internet access speeds 100 times faster than 56.6 modems.

Item: Qwest Communications International of Denver and Level 3 Communications of Omaha remind us that they are already deploying such networks, only on a more limited scale.

Item: Ericsson, Lucent Technologies, and Siemens Business Communications rolled out VOIP products and strategies at NetWorld+Interop.

Item: *Computer Reseller News*, authoritative computer retail trade paper, reported that Internet telephony appears poised to become a breakthrough technology, and that some pioneering resellers are positioning themselves to get in on the bottom floor.

Item: Lucent Technologies and VocalTec Communications announced plans at SuperComm to develop full interoperability between their IP telephony platforms. In addition, ITXC announced it will be the first carrier to operate an interoperable IP telephony network using the two companies' products.

On the debit side is the full-court press by the giant telcos to stifle development of Internet telephony, considering the big political guns they can bring to the task. They claim that if Net phone calls were subject to the same fees as theirs are, there would be little or no savings.

That remains to be seen. It might be true for large companies with enough telephony volume to get rates of a few cents per minute from the telcos, but probably not for the SOHO and medium business market. ◆

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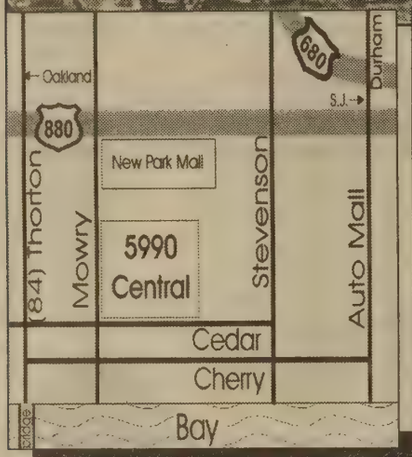

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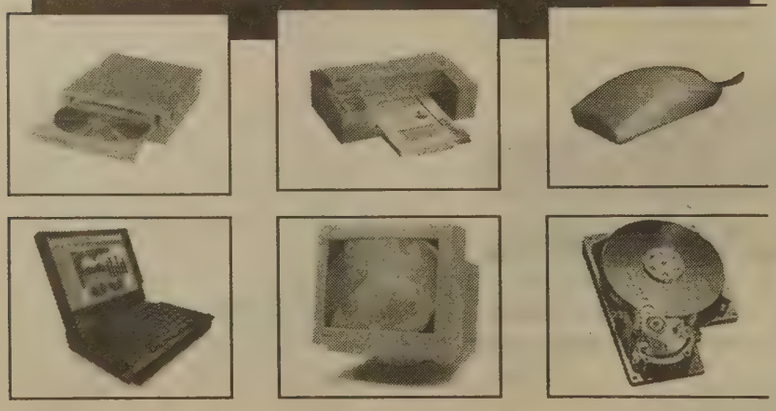

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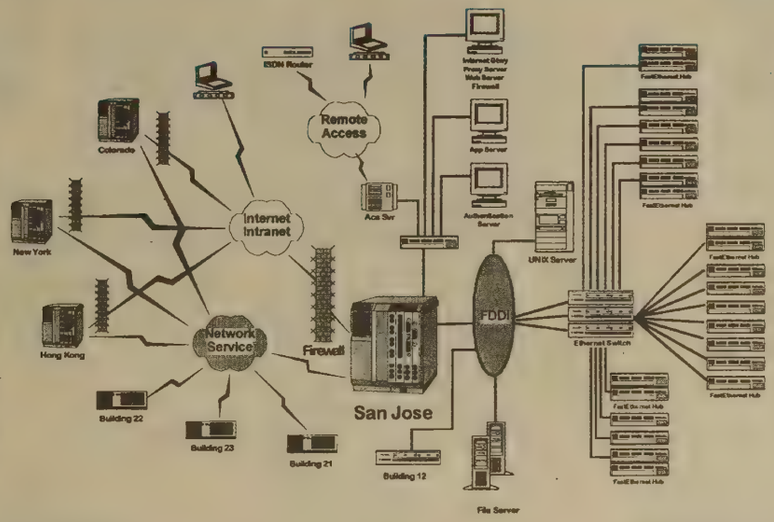

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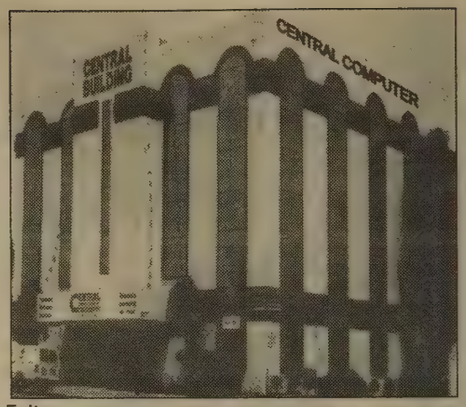

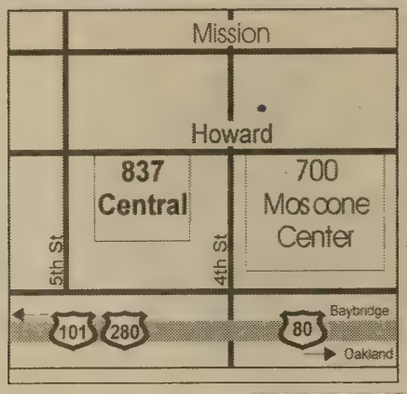

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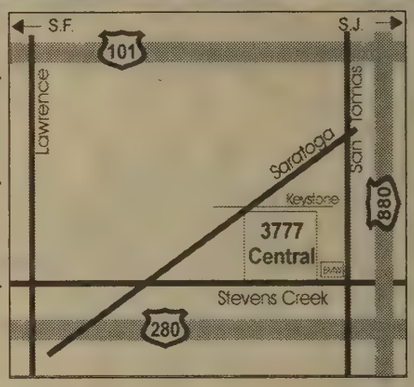

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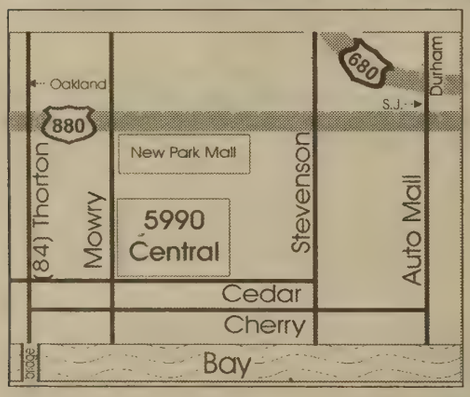

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- Yamaha M7 Multimedia Speakers
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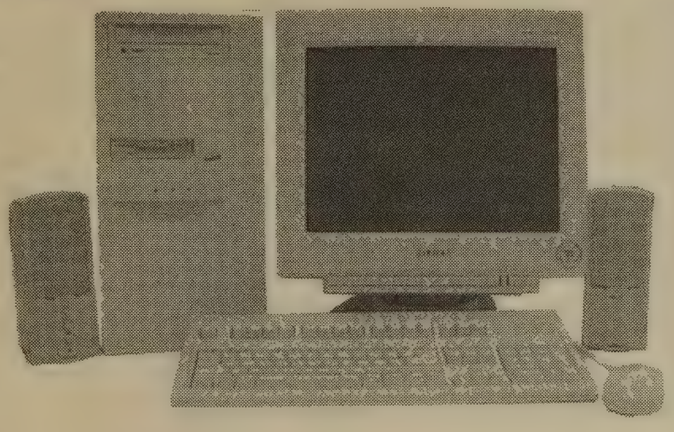
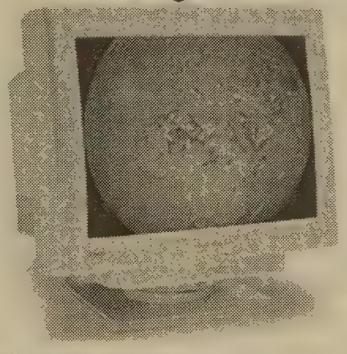
- Microsoft PS/2 Mouse w/ Pad
- ATX Mid-Tower Case w/ 235W Power Supply
- Microsoft Windows® 98 CD
- Monitor not included
- 2 Months of Free Internet with Sirius



400MHz Pentium® II w/MMX Technology.....$1929

MMX intel inside pentium II

iiyama SPECIALS



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- Microsoft Windows® 98 CD
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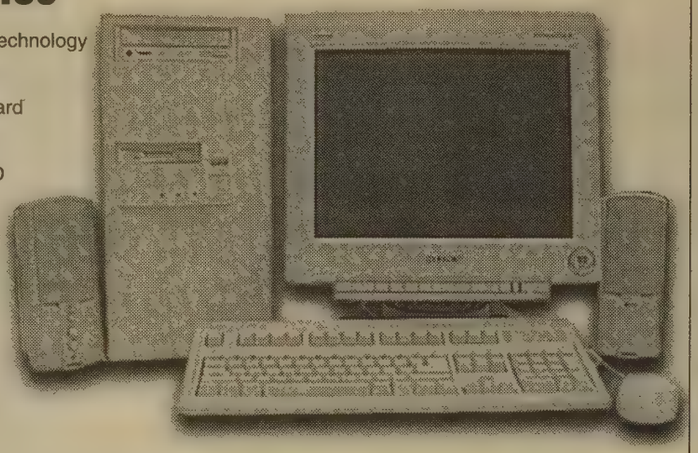

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- J-Bond PCI500C-K, 430TX Motherboard
- Western Digital 3.2 Ultra DMA HDD
- 24X max CD-ROM, Teac 1.44MB FDD
- Diamond 3D 2000 Pro 2MB PCI
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- SD693 Multimedia Speakers
- Mitsumi ZW Keyboard
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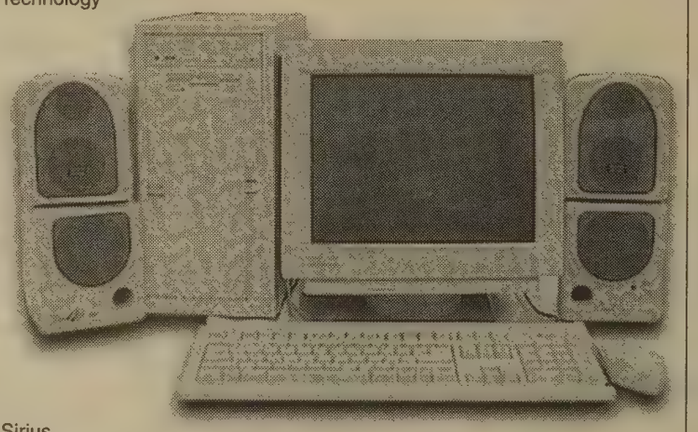

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- J-Bond PCI600E 440LX AGP Motherboard
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- Western Digital 3.2GB UltraDMA HDD
- 32X max CD-ROM Drive & Teac 1.44MB FDD
- 56k Internal Fax/Modem
- Yamaha OPL-3 Sound
- SD737 Multimedia Speakers
- Keytronic PS/2 Keyboard
- Microsoft PS/2 Mouse
- ATX Mid-Tower Case w/ 235W Power Supply
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#9: CF-8501S Full Tower, 250W, Open Side 89
#10: KS-A5561 Full Tower, 250W, Slide Open, 2 Fans 115
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#12: GT312 Full Tower, 300W, Open Side, 2 Fans 139
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#A3: ATX Mid Tower, 235W, Black 89
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#A7: ATX GT-312 Full Tower, 250W 135
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CF7042: 4 half ht SCSI-2, 200W 123
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LDP (LOMAS DATA)
Fast SCSI-2 PCI 10Mb/s *(99)
Fast PCI 20, Ultra-Wide-SCSI 40Mb/s *(195)

SIIG (5YR. WARRANTY)
CN2419 EIDE/ 4HD/ 2FD/ 16-bit ISA 49
CN2420 EIDE/ 4HD/ 16-bit ISA 39
CN2424 EIDE/ 4HD/ 2FD/ 2S 1P 1G/ 16550/ IEEE1284 62

4. CPU

AMD
K6-200 w/ Fan 69
K6-233 w/ Fan / Boxed version 3 yr warranty 95/95
K6-300 w/ Fan Boxed version, 3 yr warranty 155
K62-300 w/ Fan Boxed version, 3 yr warranty 189

Cyrix (W. FAN)
6x86MX-P166 / Boxed version 69/89
6x86MX-P200 Boxed version 119

intel
MMX-166Mhz Pentium® 99
MMX-200Mhz Pentium® / w/ 3 yr. warranty 109/119
MMX-233Mhz Pentium® / w/ 3 yr. warranty 125/129
P54C-133Mhz Pentium® 59
P54C-166Mhz Pentium® 75
P54C-200Mhz Pentium® 145
Pentium® Pro 150Mhz w/ fan & 256k 169
Pentium® Pro 180Mhz w/ fan & 256k 169
Pentium® Pro 200Mhz w/ fan & 256k 409
Pentium® II 233Mhz w/ fan & 3 yr. warranty 189
Pentium® II 266Mhz w/ fan & 3 yr. warranty 235
Pentium® II 300Mhz w/ fan & 3 yr warranty 345
Pentium® II 333Mhz w/ fan & 3 yr. warranty 459
Pentium® II 350Mhz w/ fan & 3 yr. warranty 575
Pentium® II 400Mhz w/ fan & 3 yr. warranty 795

OTHERS
Cooling Fan for 486 CPU 3.95
Cooling Fan for Pentium® / Pentium® II 4.95/9.95
Edimax CPU Switch
- CAS221 VGA, Keyboard, Mouse for 2PC 135
- CAS421 for 4PC (AT & PS/2) 199
- CAS601 for 6PC AT only / PS/2 235/236

5. DIGITIZER

SUMMASKETCH (CALCOMP)
III 12x12, 4 or 6 button Cursor or Stylus *(249)
III Pro 12x18, 4 button Cursor 465

WACOM
Art Pad II 4x5, w/ Erasing Ultra Pen, PC *(129)
Art Pad II 4x5, w/ Erasing Ultra Pen, MAC 139
Art Pad II 4x5, w/ Painter, PC *(155)
Art Z II 6x8, w/ Erasing Ultra Pen, PC *(299)
Art Z II 6x8, w/ Fractal Expression, PC *(359)
Art Z II 6x8, w/ Painter 5.0, PC 375
Art Z II 6x8, for MAC 309
Art Z II 12x12, w/ Erasing Ultra Pen, PC 415
Art Z II 12x12, for MAC 429
Art Z II 12x12, w/ Fractal Expression, PC 479
Art Z II 12x12, w/ Painter 5.0, PC *(485)
Art Z II 12x18, w/ Erasing Ultra Pen, PC 685
CT-0405 Pen Partner w/ Corel Print & Photohouse *(85)
UC-520 4-button Pack 45
UD-2 MAC Kit 45
UP-201 Pressure Sensitive Stylus 49.95
UP-701E Erasing Ultra Pen 64.95
UP-801EW Erasing Ultra Pen 69.95

6. DRIVES

One Year Warranty on All Disk Drives

FLOPPY DRIVE:

MITSUBISHI
LS-120 120MB w/ cartridge, 3.5" 115

TEAC
1.44MB 3.5" / w/ frame 25/29

HARD DRIVE

FUJITSU
MPB3032AT 3.2GB 10ms 128k IDE Ultra-DMA *(135)
MPB3043AT 4.3GB 10ms 128k IDE Ultra-DMA 159
MPA3064AT 6.4GB 10ms 128k IDE Ultra-DMA 209

IBM
DCAS-34330 4.3GB 8.5ms UW-SCSI, 5400rpm *(275)

KINGSTON
DataPak PCMCIA 520MB 479

MAXTOR
90432D3 4.3GB 9.5ms IDE Ultra DMA 159
90720D5 7.2GB 9.5ms IDE Ultra DMA 219
8400D 8.4GB 10ms IDE Ultra-DMA 265
91152D 11.5GB 9.5ms IDE Ultra DMA 359

Quantum
ST32100SE-A 2.1GB 9.5ms 128k IDE Ultra-DMA 132
ST33200SE-A 3.2GB 9.5ms 128k IDE Ultra-DMA 139
ST34300SE-A 4.3GB 9.5ms 128k IDE Ultra-DMA 165
ST36400SE-A 6.4GB 9.5ms 128k IDE, 5400rpm 225
ST38400SE-A 8.4GB IDE Ultra-DMA 285
ST32100SE-S 2GB 10ms 128k SCSI-2 199
ST33200E 3.2GB 10ms 128k Ultra SCSI 255
ST34300E 4.3GB 10ms 128k Ultra SCSI 265
ST36400SE-S 6.4GB 10ms 128k Ultra SCSI 379
ST38400SE-S 8.4GB 10ms 128k Ultra SCSI 479
Viking II QM304550PX-SW 4.5GB Wide SCSI 599
Atlas 3 QM309100TD-LW 9.1GB L-Wide-SCSI 815
Atlas 3 QM318200TD-LW 18GB L-Wide-SCSI 1295

SAMSUNG
WU33205A 3.2GB 10ms 128k IDE Ultra-DMA 135
WU34323AU 4.3GB 10ms IDE Ultra-DMA 155

Seagate
ST-33232A 3.2GB IDE DMA 145

* 5 year warranty for below drives *
ST-32272N 2.2GB 9ms Ultra SCSI 309
ST-32272W 2.2GB 9ms Ultra-Wide SCSI 349
ST-34501W 4.5GB UW-SCSI, 10,000rpm 559
ST-34573N 4.5GB 9ms Ultra SCSI 509
ST-34573W 4.5GB 9ms Ultra-Wide SCSI 539
ST-19101N 9GB Ultra SCSI, 10,000rpm 849
ST-19101W 9GB UW-SCSI, 10,000rpm 859

*(sale price) ..... SPECIALS, limited to stock on hand
Prices subject to change without notice

http://www.centralcomputer.com for current prices & product catalog

ST-39173N 9GB Ultra SCSI, 7,200rpm 709
*ST-39173W 9GB Ultra-Wide SCSI, 7,200rpm ..... *(699)*

TOSHIBA (FOR NOTEBOOK)
MK3205MAV 3.2GB 13ms 128k IDE 2.5" 229
MK4006MAV 4GB 13ms 315

WESTERN DIGITAL
SALE

(limit 1 per customer, while supplies last)
AC23200 3.2GB 11ms 128k IDE 145

*AC24300 4.3GB 9.5ms IDE DMA ..... *(155)*
AC35100 5.1GB 9.5ms IDE Ultra-DMA 185
AC36400 6.4GB 9.5ms IDE Ultra-DMA 215
AC38400 8.4GB 9.5ms IDE Ultra-DMA 289

* 5 yr warranty for below drives *
WDE2170 2.17GB 8ms 512k Ultra SCSI 329
WDE2170 2.17GB 8ms 512k Ultra-Wide SCSI 349
*WDE4360 4.3GB 8ms 1MB Ultra SCSI ..... *(415)*
*WDE4360 4.3GB 8ms 1MB Ultra-Wide SCSI ..... *(419)*

REMOVABLE DRIVE:

AVATAR ($50 REBATE)
Shark 250MB Portable Drive Parallel 195
Shark 250MB Cartridge Single 37.95

EZONICS
PalmZip PCMCIA Drive (Get Instant Rebate $20 or, 2 Zip Disk Free) 249

iomega
Jaz Disk 1GB - Single / 3-pk / 5-pk 79/235/389
Jaz Disk 2GB - Single / 3-pk 89/264
*Jaz Drive 1GB SCSI Int / Ext ..... *(255/269)*
Jaz Drive 2GB SCSI Int / Ext 439/469
Jaz Traveller 45
Zip Disk 100MB - Single / 3-pk 8.95/26
- 6-pk / 10-pk ..... 52/*(85)
*Zip Drive 100MB Parallel ..... *(129)*
Zip Drive 100MB IDE Int w. Tools oem 85
Zip Drive 100MB SCSI Int w. Tools oem 105
*Zip Drive 100MB SCSI Int / Ext ..... *(129/129)*
*Zip Drive 100 Plus (SCSI & Parallel) ..... *(169)*
Zip Zoom SCSI Accelerator Card for Ext 46

SYQUEST
Sparq 1GB IDE Int 189
Sparq 1GB Parallel 195
*1GB Sparq Cartridge ..... *(31.50)*
SyJet 1.5GB IDE Int 279
SyJet 1.5GB Parallel 289
SyJet 1.5GB SCSI Int / Ext 279/289
*1.5GB SyJet Cartridge ..... *(65)*

7. I/O CARD

ADDONICS (QUICKPATH)
Flexport 22EX 2S/ 2P/ 16650 95
Flexport 42 4S/ 2P/ Bi-Dir/ 16550 95

KOUWELL
KW508-E Single Parallel Port 12
KW524-J 2S/ 2P/ 16550 23

SIIG
Cyberpro 2S Highspeed w. 16650 55
Cyberpro 4S Highspeed w. 16650 85
IO1809 2S/ 1P/ 16550 39
IO1829 Cyber Single Serial PCI 55
IO1839 Cyber Parallel PCI 55
IEEE 1284 EPP/ ECP/ Parallel Port 32

SOCKET COMMUNICATION
PCMCIA Serial I/O 16550 149
PCMCIA Dual Serial I/O 215

STB 4-COM
4S/ 16-bit/ 16550/ support Com 1-8, IRQ 99

8. KEYBOARD

FOCUS
FK2001 104 for Win'95 26
FK7200 104 Trackball 27
FK8200 124 Key w. calculator 42
FK9200W 124 Key w. trackball & calculator 45

KEYTRONIC
104 Key - White / Black ..... *(24)/39
104 Key PS/2 26
104 Key PS/2 & AT Combo 28
104 Key Tag Along w. Mouse - White / Black 28/29
LT Touch Pad 85
Pilot 104 Combo 15
Wireless IR Classic 104 58
Wireless IR Touchpad / Trackball 75/74

Microsoft
*Natural Keyboard Elite PS/2 oem ..... *(39)*

QTRONIX
Scorpius 104+ for Win'95 - White / Black 23/24
Scorpius 105 / w. Trackball 32/49

SIIG
Minitouch 81 Key, Click 45
W104 for Win'95 29
Wintouch 104 35

OTHERS
ANTEC 104 Key - White / Black 18/39
ANTEC Wrist Support 9.99
BTC 5100 Mini 80 Key 29
EZ 1000 Smart 29
EZ 9720 3D Smart 39
MAXI 101 Key 25
*MITSUMI 104 Model EW ..... *(14.50)*

9. MEMORY

DRAM
256k x 4 - 70ns 3.50

DIMM
4 x 72 - 60ns, 168-pin (32MB) 65
8 x 72 - 60ns, 168-pin (64MB) 109
16 x 72 - 60ns, 168-pin (128MB) 209
Unbuffer PC100 4 x 64 - 8ns (32MB) 55
Unbuffer PC100 8 x 64 - 8ns (64MB) 99
Unbuffer PC100 16 x 64 - 8ns (128MB) 179
Unbuffer SDRAM 2 x 64 - 10ns (16MB) 25
Unbuffer SDRAM 4 x 64 - 10ns (32MB) 35
Unbuffer SDRAM 8 x 64 - 10ns (64MB) 79
Unbuffer SDRAM 16 x 64 - 10ns (128MB) 145
PC100 w/ECC 8 x 72 - 8ns (64MB) 119
PC100 w/ECC 16 x 72 - 8ns (128MB) 209
SDRAM w/ECC 4 x 72 - 10ns (32MB) 49
SDRAM w/ECC 8 x 72 - 10ns (64MB) 99
SDRAM w/ECC 16 x 72 - 10ns (128MB) 189

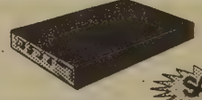
SIMM
4 x 9 - 60ns, 30-pin (4MB) 15
1 x 36 - 60ns, 72-pin (4MB) 15
2 x 36 - 60ns, 72-pin (8MB) 35
4 x 36 - 60ns, 72-pin (16MB) 35
8 x 36 - 60ns, 72-pin (32MB) 59
16 x 36 - 60ns, 72-pin (64MB) 159
EDO 1 x 32 - 60ns (4MB) 9
EDO 2 x 32 - 60ns (8MB) 13
EDO 4 x 32 - 60ns (16MB) 17
EDO 8 x 32 - 60ns (32MB) 35
EDO 16 x 32 - 60ns (64MB) 129
Non Parity 1 x 32 - 60ns (4MB) 9
Non Parity 2 x 32 - 60ns (8MB) 13
Non Parity 4 x 32 - 60ns (16MB) 17
Non Parity 8 x 32 - 60ns (32MB) 35
Non Parity 16 x 32 - 60ns (64MB) 129

NOTEBOOK MEMORY (3RD PARTY)
for Compaq Armada 4120/ 4130
- 8MB / 16MB / 32MB 55/79/139
for Compaq Contura 410C/ 420C/ 430C
- 4MB / 8MB / 16MB 45/55/85
for DEC HiNote VP535/ 545/ 567
- 8MB / 16MB / 32MB / 64MB 55/79/139/295
for HP Omnibook 5000C/ CT/ CTS/ 5500/ 5700
- 8MB / 16MB / 32MB / 64MB 59/85/139/299
for IBM Thinkpad 365X/ 560/ 760EX/ ED/ EL
- 8MB / 16MB / 32MB 65/135/185
for NEC Versa 6030X/ H
- 8MB / 16MB / 32MB 65/99/165
for Panasonic CF62EX/ 25EX
- 8MB / 16MB / 32MB 95/145/325
for TI TravelMate 6020/ 6030
- 8MB / 16MB 79/149
for Toshiba Libretto 50CT
- 8MB / 16MB 65/179
for Toshiba T1900/ T4500/ T200CS
- 4MB / 8MB / 16MB 89/109/165
for Toshiba T2100 series
- 4MB / 8MB / 16MB / 24MB 45/59/85/145
for Toshiba Portege 300CDT
- 16MB / 32MB 145/169
for Toshiba Portege 610CT
- 8MB / 16MB / 32MB 79/99/169
for Toshiba Portege 650/ 660CDT
- 8MB / 16MB / 32MB / 64MB 75/99/169/299
for Toshiba Satellite Pro 400
- 8MB / 16MB / 32MB 75/99/169
for Toshiba Tecra 500CDT
- 16MB / 32MB / 48MB 89/159/225
*for Toshiba Tecra 700 - 32MB ..... *(235)*
for Toshiba Tecra 710/ 720/ 730CDT
- 8MB / 16MB / 32MB / 64MB 89/130/249/315

PCMCIA FLASH RAM CARD
4MB / 8MB / 10MB / 16MB / 20MB 125/165/179/225/259

PRINTER MEMORY
for HP Laser II / IID
- 1MB / 2MB / 4MB 69/89/175
for HP Laser III / IIIP / IIID
- 1MB / 2MB / 4MB 65/89/125
for HP Laser 4L - 1MB 49
for HP Laser 4 / 4M / 4Si / 1200C
- 4MB / 8MB 35/59
for HP Laser 4+ / 4V / 5 / 5N / 5P / 5Si / 6P / Color Laser 5 / Color Laser 5M / 1600C
- 4MB / 8MB / 16MB / 32MB 29/45/79/165
for HP Laser 5L / 6LXi
- 4MB / 8MB 65/89
for HP Laser 4000
- 8MB / 16MB / 32MB 49/79/199

10. MODEMS & FAX



SALE

3COM (US ROBOTICS)
Courier I-Modem #U w. Analog Int / Ext 239/285
Courier v.90 56k Int / Ext 235/269
*Courier V. Everything 56k Int / Ext ..... *(199/225)*
*#839 Sportster v.34 33.6 Fax Ext ..... *(105)*
*#840 Sportster v.34 33.6 Fax Int oem / reg ..... *(69/79)*
#1171 Sportster v.34 33.6 Fax/ Voice/ Mail/ Speaker Phone Int 95
#1172 Sportster v.34 33.6 Fax/ Voice/ Mail/ Speaker Phone Ext 115
#1784 Sportster 56k w. Voice Ext 175
#1785 Sportster 56k w. Voice Int 149
*#1786 Sportster 56k Ext ..... *(155)*
*#1787 Sportster 56k Int ..... *(99)*
#5606 Sportster 56k v.90 w. Voice Ext 225
#5685 Sportster 56k v.90 Voice Int oem / reg . 139/169
#5686 Sportster 56k v.90 Ext 155
#5687 Sportster 56k v.90 Int oem / reg 109/135
#9040 Sportster ISDN 128k Int 185

BOCA
SALE

(5-in-1 multimedia)
SE14SRS 14.4 Sound Expression Int ..... *(29)
SE34SRS 28.8 Sound Expression Int ..... *(49)

CREATIVE LABS
Modem Blaster Flash 56k Voice, Speaker Phone Int 125

DIAMOND
Supra Express 33.6 Fax PnP Int 65
Supra Express 56k Fax PnP Int oem / reg 75/105
Supra Express 56k Fax PnP Ext 135
Supra Max 56k v.90 PCI Int 65

Hayes
*Accura 33.6 Fax Int / Ext ..... *(125/149)*
Accura 56k Int / Ext 159/179
Optima 33.6 v.34 Fax Int / Ext 189/199
*Optima 288 v.34 PCMCIA w. EZ jack ..... *(99)*
*PC288MT 28.8 v.34 Fax Ext ..... *(99)*
*PA1288HC 28.8 v.34 Int ..... *(69)*
PM336HC Int / PM336MT Ext 95/115
PM56HC Int / PM56MT Ext 145/165

MEGAHERTZ
*XJ1336 PCMCIA 33.6 Flash upgradable ..... *(175)*
*XJ1560 PCMCIA 56k ..... *(209)*
XJ2560 PCMCIA 56k 179
*XJ4336M PCMCIA 33.6 cellular w. Motorola cable *(195)*
XJ4336 Cellular Capable 33.6 179
*XJ5560 Cellular Capable 56k ..... *(219)*

MICROCOM
*Deskporte 28.8P v.34 Fax Ext Parallel ..... *(99)*
*Deskporte 28.8S v.34 Fax Ext ..... *(95)*
Officeporte 33.6 Voice ASVD Ext 155

MOTOROLA
SALE

BitSerfer #1749 Pro ISDN Multilink PPP Ext ... *(299)
BitSerfer #1750 ISA ISDN ..... *(199)
BitSerfer #1994 Pro ISA for ISDN ..... *(298)
BitSerfer Pro ISDN Easy Ext ..... *(275)
Modem Serfer 33.6 Int / Ext ..... *(75/95)
Modem Serfer 56k Int / Ext ..... *(94/109)
NT1D Network Terminator 165
Online Serfer 28.8 Fax Int / Ext ..... *(65/69)
Premier 33.6 Int / Ext ..... *(149/169)
Voice Serfer 33.6 Int / Ext ..... *(99/115)

SIMPLE TECHNOLOGY
Communicator 56k PCMCIA Voice & Cellular 199

WISECOM
SALE

(5 year warranty)
3314-JS3 33.6 Fax/Voice Int (Rockwell) 39.95
5614-JS3 56k Data Fax/ Voice Int (Rockwell) .. 56

XIRCOM
*CM-33 33.6 Fax PCMCIA ..... *(159)*
CM-56G 56k PCMCIA Global Access 215

ZOOM (7 YR WARRANTY)
*#2805 33.6 Fax Int ..... *(95)*
#2818 56k Flex Comstar Int 135
#2819 56k Fax Int 115
*#2836 33.6 Fax Ext ..... *(105)*
#2849 56k Fax Ext 136
#2925 v.90 56K Flex PCI Int 89

11. MONITORS

Monitors on Display at our stores for your comparison

Acer
*78iE 17" 1600 x 1200 .26 NI 68hz ..... *(349)*

ARTMEDIA (SONY OEM)
*TX1664 15" 1280 x 1024 .25 NI 60hz ..... *(289)*
TN1885T 17" 1600 x 1200 .25 NI 60hz 599
TX1864 17" 1280 x 1024 .25 NI 60hz 499
TN2185T 20" 1600 x 1200 .30 NI 60hz 1055
GT-960T 20" 1600 x 1200 .25 NI 75hz 1159

CTX
PR700 17" 1280 x 1024 .25mm AG, 30-70khz 495
*PR710 17" 1600 x 1200 .25mm AG, 30-92khz ..... *(519)*
*VL710 17" 1600 x 1280 .26 30-92khz ..... *(339)*
*VL950 19" 1600 x 1200 .26 NI ..... *(565)*
EX800 20" 1600 x 1280 .28 30-85khz 879
*EX900 21" 1600 x 1280 .28 NI ..... *(879)*

DIGIVIEW
*HR-1435 14" 1024 x 768 .28 NI 85hz ..... *(115)*
HR-1510 15" 1280 x 1024 .28 NI 85hz 165
*HR-1707+ 17" 1280 x 1024 .28 NI 85hz ..... *(279)*
HR-1709D 17" 1600 x 1200 .25 NI 439
HR-1901 19" 1600 x 1200 .26 NI 75hz 639

EIZO
*FX-C5 17" 1280 x 1024 .28mm AG, 86hz ..... *(599)*
TX-C7 17" 1600 x 1200 .25, Trinitron 789
TX-D7S 20" 1600 x 1200 .25mm AG, 75hz 1545
FX-E8 21" 1600 x 1200 .26mm AG, 87hz 2045

HITACHI SuperScan®
*CM500U 15" Flat 1280 x 1024 .28 NI, 65hz ..... *(229)*
*CM630U 17" Flat 1600 x 1200 .26 NI ..... *(415)*
*CM751 19" 1600 x 1200 .26 NI, 75hz ..... *(775)*
*CM800U 21" 1600 x 1200 .22 NI ..... *(1045)*
*CM802U 21" 1600 x 1200 .22 NI ..... *(1215)*
*CM803U 21" 1800 x 1440 .22 NI, 77hz ..... *(1529)*

Hyundai
SALE

(3 Year warranty)
MF-8515G 15" 1280 x 1024 .28 NI 64hz 239
MF-8617E 17" 1600 x 1200 .26 NI, 69hz 469
MT-9017E 17" 1600 x 1200 .25mm AG, 72hz 515
S-901GT 19" 1600 x 1200 .26 NI 80hz 685
S-102GT 21" 1800 x 1440 .27 NI 74hz 1015
A-102GT 21" 1800 x 1440 .28mm AG, 74hz 1025

LCD FLAT PANEL:
TXA3601GT 14.1" TFT, 1024 x 768, 72hz 995

IMPRESSION
3 Plus 14" 1024 x 768 .28 NI 139
*5 Plus 15" 1280 x 1024 .28 NI ..... *(159)*
*7 Plus 17" 1280 x 1024 .28 NI ..... *(249)*

MAG
*DJ702 17" 1280 x 1024 .26 NI 65hz ..... *(339)*
*DJ702E 17" 1280 x 1024 .28 NI ..... *(339)*
*DJ717 17" 1600 x 1200 .26 NI ..... *(425)*
*DX700T 17" 1280 x 1024 .25 NI ..... *(349)*
*DJ800 19" 1600 x 1200 .26 NI ..... *(565)*

NEC
*A500 15" 1280 x 1024 .28 NI 60hz ..... *(235)*
*E500 15" 1280 x 1024 .25 NI 65hz ..... *(285)*
*M500 15" 1280 x 1024 .25 NI 65hz ..... *(349)*
*A700 17" 1280 x 1024 .28 NI 65hz ..... *(349)*
*E700 17" 1600 x 1200 .25 NI 65hz ..... *(535)*

*(sale price) ..... SPECIALS, limited to stock on hand
Prices subject to change without notice.

http://www.centralcomputer.com for current prices & product catalog

*M1700 17" 1280 x 1024 .25 NI 65hz ..... *(589)*
*P750 17" 1600 x 1200 .25 NI 75hz ..... *(755)*
E900 19" 1600 x 1200 .28 NI 73hz ($50 Rebate) 825
*E1100 21" 1600 x 1200 .28 NI 65hz ..... *(1049)*
*P1150 21" 1600 x 1200 .25 NI 75hz ..... *(1195)*

NOKIA

*447L 17" 1024 x 768 .28 NI 80hz ..... *(499)*
447XAV 17" 1280 x 1024 .25mm AG, NI 85hz 715
*447Xi 17" 1280 x 1024 .25mm AG, NI 85hz ..... *(689)*
445XAV 21" 1600 x 1200 .28 NI 80hz 1845
*445Xi 21" 1600 x 1200 .26 NI80hz, TCO95 ..... *(1425)*
445XPro 21" 1800 x 1440 .26 NI 80hz 1549

OPTIQUEST

V655 15" 1280 x 1024 .28 NI 61hz, Digital 329
V775 17" 1600 x 1280 .26 NI 68hz 625
V95 19" 1600 x 1280 .26 NI 76hz 699
2082DC 20" 1600 x 1200 .28 NI 1199

PIXO

15" 1280 x 1024 .28 NI 179
17" 1280 x 1024 .28 NI 289

PRINCETON

*EO70 17" 1280 x 1024 .28 NI 65hz ..... *(325)*
*EO75 17" 1600 x 1280 .26 NI ..... *(465)*
*EO90 19" 1600 x 1200 .26 NI ..... *(625)*
*Ultra 17+ 17" 1600 x 1280 .28 NI ..... *(399)*

RELISYS

RE451 14" 1024 x 768 .28 NI 119

SCEPTRE

(3 Year Warranty)
*P401 14" 1024 x 768 .28 NI 60hz, Digital ..... *(139)*
*P511 15" 1280 x 1024 .28 NI 60hz, Digital ..... *(179)*
P73 17" 1280 x 1024 .28 NI 65hz, Digital 299
*P75A 17" 1600 x 1200 .26 NI 70hz, Digital ..... *(389)*

LCD PANEL: (1 yr warranty)

CD-1112T 12.1" TFT, 800 x 600, 256k color 845
FT15 15" TFT, 1024 x 768, color 1099

SHAMROCK

C409 14" 1024 x 768 .28 NI 129
C505 15" 1280 x 1024 .28 NI 165
C707L 17" 1600 x 1200 .26 O.S.D. control 315
C708T 17" 1600 x 1200 .25 O.S.D. control 429

SHARP (LCD PANEL)

CE-LT14MN 13.8" Active XGA w. Speakers 1279
LL-T150A 15" Active XGA w. Speakers 2025

SONY

*CPD-100ES 15" 1280 x 1024 .25mm AG, 60hz ..... *(285)*
*CPD-100GS 15" 1280 x 1024 .25mm AG, 60hz ..... *(339)*
*CPD-200ES 17" 1280 x 1024 .25mm AG, 60hz ..... *(495)*
*CPD-200GS 17" 1280 x 1024 .25mm AG, 75hz ..... *(599)*
*GDM-200PS 17" 1600 x 1200 .25mm AG, 70hz ..... *(769)*
*GDM-400PS 19" 1600 x 1200 .25mm AG, 75hz ..... *(975)*
*GDM-500PS 21" 1600 x 1200 .25mm AG, 85hz ..... *(1329)*

TVS

9" 1024 x 768 VGA Mono 109

ViewSonic

E641 14" 1024 x 768 .28 NI 85hz 159
E655 15" 1280 x 1024 .28 NI 81hz 235
*15GA 15" 1280 x 1024 .27 65hz, Speaker Phone ..... *(365)*
P665 15" 1280 x 1024 .27 NI 66hz 265
EA771 17" 1280 x 1024 .27 NI 66hz, PnP 489
*GS771 17" 1280 x 1024 .27 NI 66hz ..... *(375)*
*P775 17" 1600 x 1200 .25 NI 76hz ..... *(469)*
PT775 17" 1600 x 1200 .25 NI 77hz, Sonictron 669
G790 19" 1600 x 1280 .26 NI 76hz 615
PS790 19" 1600 x 1200 .25 NI 699
*G800 20" 1600 x 1280 .28 NI 69hz ..... *(955)*
G810 21" 1600 x 1200 .25 NI 73hz 985
P810 21" 1600 x 1200 .25 NI 76hz 1099
P815 21" 1800 x 1440 .25 NI 76hz 1235
PT813 21" 1600 x 1200 .28mm AG, NI 85hz 1285
*29GA 29" 1280 x 1024 .75 stripe pitch ..... *(1959)*

VIEWTRONIC

*DX-1764Q 17" 1280 x 1024 .26 NI ..... *(299)*

12. MOTHERBOARDS

ABIT

AX-5 ATX, 512k, 430TX chipset 88
BX-6 ATX, 440BX chipset 159
LX-6 ATX, 440LX chipset 119
*PD5N 512k, SIS chipset ..... *(78)*
*PX-5 512k, 430TX chipset ..... *(79)*
TX-5 512k, 430TX chipset 89

ASUS

P2B ATX, 440BX chipset 175
P2BS ATX, 440BX chipset, SCSI 299
P2BDS ATX, Dual, 440BX chipset, SCSI 455
*P2L97 ATX, 440LX chipset ..... *(135)*
*P2L97S ATX, 440LX chipset, SCSI ..... *(225)*
P2L97DS ATX, Dual, 440LX chipset, SCSI 349
SP97 512k, SiS chipset 89
TX97L 512k, 430TX chipset, Dimm 113
TX97LE 512k, 430TX chipset, 4 Simm/ 2 Dimm 114
TX97X ATX, 512k, 430TX chipset, Dimm 118
TX97XE ATX, 430TX, 4 Simm/ 2 Dimm 119
TX97XE w. Sound 155
TXP4 430TX chipset, 4 Simm/ 2 Dimm 99

FIC

PA-2011 ATX, 512k, Via chipset 95
PA-2012 ATX, 1MB, Via chipset 115
VA-502 512k, Via chipset, IDE I/O 69
VA-503+ ATX, 512k, Via chipset, IDE I/O 109

GAIN WARD

5VPA (for AMD K62-300) 512k, Via, IDE I/O 89

GIGABYTE

GA586TX2 512k, 430TX, IDE I/O 105
GA586ATX3 ATX, 512k, 430TX, IDE I/O 109
GA686LX ATX, 440LX, IDE I/O 129

intel

Atlanta 440LX chipset / w. Sound 165/185
DK440LX Dual, Wide SCSI, Sound, for WS 485
R440LX Dual, Wide SCSI,Lan,VGA, for Server 499
Seattle (P-II 350-400Mhz), 440BX chipset,
- w. ISA Sound / PCI Sound 199/209

J-BOND

*PCI500C-J: ATX, up to P-300, CPU Alarm ..... *(95)*
- w. AHA2940UW SCSI 229
PCI500C-K: up to P-300, 512k, 430TX, USB 85
- w. AHA-2940U SCSI 159
- w. AHA-2940UW SCSI 219
PCI500C-N: up to P-300, VP3, AGP, 3 Dimm 84
PCI600E: ATX, 440LX, AGP, 4PCI 115
PCI600F: (PII 233-450Mhz) ATX, 440BX 145
PCI600W: ATX, 440BX, w. AHA-2940UW SCSI 265

M-TECH

Mustang R534E 512k, IDE I/O 109

SUPERMICRO

P5MMA98 ATX, 512k, 430TX, EIDE I/O 105
P5MMS98 512k, 430TX chipset, EIDE 103
P6DBE ATX, Dual, 440BX chipset 259
P6DBS ATX, Dual, 440BX chipset, UW-SCSI 385
*P6DLS ATX, Dual, 440LX, 2940UW SCSI ..... *(275)*
P6SBA ATX, 440BX chipset, EIDE I/O 145
P6SBS ATX, 440BX chipset, UW-SCSI 259
P6SLA ATX, 440LX, EIDE I/O 125
P6SNS 440FX chipset, w. 2940UW SCSI 179

TEKRAM TECH

Office Pro P55VP 512k, Via chipset, IDE I/O 99
Office Pro P6BX ATX, 440BX chipset 149
Office Pro P6LX ATX, 440LX chipset 105

TYAN

1564D Tomcat IV 512k, Dual, 430HX chipset 175
1564S Tomcat IV 512k, 430HX chipset 139
1571S 512k, 430TX chipset 109
1573S ATX, 512k, 430TX chipset 115
1692DL ATX, Tiger II Dual, 440LX 199
1692S ATX, Tiger II Single 149

13. MOUSE & JOYSTICK

CIRQUE (TOUCH PAD)

Easy Cat PnP 29
Power Cat w. Signature Pen 65
Smart Cat w. Scroll & Zoom 44

IBM

Black Scroll Mouse 39.95
White Scroll Point Mouse 39

KENSINGTON

Expert Bus 5.0 115
*Expert Serial & Trackball 5.0 ..... *(84)*
*Mouse in a Box ..... *(16.95)*
*Orbit Trackball ..... *(49)*
*Thinking Mouse Serial & PS/2 ..... *(55)*

LOGITECH

*Coredless Mouseman Pro ..... *(49)*
*First Mouse Plus oem ..... *(19)*
Mouseman Bus 64
Mouseman Combo PC & PS/2 oem / reg 24/39
Mouseman Plus 52
Surfman Cordless Internet Controller 85
Trackman Live Cordless 125
Trackman Marble for Win'95 oem / reg 43/82
Trackman Marble FX 89

Microsoft

Bus 2.0 400dpi w. Bus Card oem / 5-pk 65/325
Combo Mouse (Serial + PS/2) 49.95
Easyball w. Freddi Fish CD 49.95
*Home Mouse Serial ..... *(19.99)*
*IntelliMouse 3.0 for Win'95 ..... *(59.95)*
- oem Serial / oem PS/2 ..... 24/28
IntelliMouse 3.0 USB 59.95
IntelliMouse Trackball 69.95
PS/2 2.0 oem 25
Serial 2.0 400dpi oem 19.95

MOUSE SYSTEMS

Mouse! Serial w. pad 19
Omni Mouse 26
*PC Trackball II ..... *(35)*
ProAgio (5-button serial) 39
Serial Bus Card (9IRQS), 5 Com 29
White Mouse (3-button) 29.95

NEC

King Mouse 2-button 13.50
King Mouse PS/2 ..... 13.95

QTRONIX

Libra 90 Pro Trackball 27
Opto-Mechanical Mouse 7.50

JOYSTICK:

C.H. PRODUCTS

Flight Stick Pro 53
Pro Pedals 79.95
Virtual Pilot / Pro (Yoke) 68/75

LOGITECH

Wingman Extreme 29

Microsoft

Side Winder 1.0 29
Side Winder 3D Pro 44
Side Winder Force Feedback 145
Side Winder Gamepad 29.95
Side Winder Precision Pro 56

QUICKSHOT

QS123A Warrior 5 12
QS206 Sky Master / w. SU-27 Flanker 25/39
QS216 Strato Warrior 23
QS217 Command Pad 9.95
QS5600V2 Master Pilot '98 + Programmer 69
QS6222 3D Striker + Hexen II 55

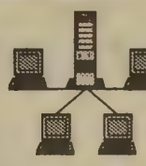
THRUSTMASTER

ACM Game Card 29.95
Attack Throttle Direct Connect 39
Elite Rudder Pedals 75
F-16 FLCS / F-16 TQS 125/129
F-22 Pro Flight Control 139
Flight Control System Pro 108
*Formula T2 ..... *(109)*
Grandprix Driving Control 53
Nascar Pro Racing Control 124
*Phazer Pad ..... *(39.95)*
Rudder Control 109
Weapon Control MKII 109
Wizzard (pinball controller + Royal Flush CD) 39
*X-Fighter Flight Control ..... *(45)*
XL Action 28

OTHERS

*Cobra (Mouse Systems) ..... *(19.95)*
Cyclone 3D 38
PC Analog Pro 19.95
PC Gamepad / Pro (10-button) 17/29
3D Virtual Images Mouse Pad ..... 7.99 ea.
Batman Logo Mouse Pad 5.49
Gotham City Mouse Pad 6.99
Looney Tunes Pad w. Screen Saver 9.95
Superman / Logo Mouse Pad 6.99/5.49
Thomas Kinkade Paintings Mouse Pad
(12 different designs) ..... 7.99 ea.
Walt Disney Mouse Pad ..... 4.99 ea.
- 101 Dalmations
- Timon & Pumbaa
- Toy Story
Warner Brothers Mouse Pad ..... 5.99 ea.
- Bugs Bunny/ Marvin the Martian/ Tasmanian/ Tweety & Sylvester/ Simpson/ Wile E. Coyote

14. NETWORK



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3Com Networking Partners Partner

*3C250B 100BaseTX Fast 12 Port Hub ..... *(779)*
*3C509B TPO (RJ45 only) oem ..... *(49)*
3C509B-TPC TP+BNC oem / reg ..... *(59)/109
3C509B Combo oem / reg 89/119
3C515-TX Fast 10/100 ISA oem / reg 129/145
*3C562D PC Card Modem 33.6 + Lan TPO ..... *(249)*
*3C562D PC Card Modem 33.6 + Lan Combo ..... *(279)*
3C574-TX 10/100 PCMCIA 149
*3C575-TX 10/100 PC Card + XJ5560 Bundle ..... *(325)*
3CCFE575BT 10/100 PC Card 159
3CXFE575BT 10/100 PC Card w. X-Jack 165
3C589D PCMCIA TP / 5-pk ..... *(139)/629
3CXE589DC PCMCIA Combo w. X-Jack 189
3CXE589DT PCMCIA 10BT w. X-Jack 149
3C589D PCMCIA Combo / 5-pk ..... *(179)/849
3C597-TX EISA 10/100 TP 239
*3C882 Impact IQ ISDN v.32bis Ext ..... *(215)*
3C892 Office Connect ISDN Net Modem 389
3C900 PCI TPO 105
3C900 PCI Combo oem / reg ..... *(85)/135
*3C905-TX PCI 10/100 TP oem / reg ..... *(75/89)*
3C905B-TX PCI (remote wake-up) oem / reg 74/95
*3C905B-NM PCI 10/100 TP oem ..... *(69)*
*3C16170 Link Builder 12 Port ..... *(299)*
3C16405 Port Switch 40 Hub 12 Port 475
*3C16406 Port Switch 40 Hub 24 Port ..... *(795)*
3C16610 10/100 12 Port Hub 899
3C16611 10/100 24 Port Hub 1279
*3C16670A Superstack II Hub 12 Port ..... *(469)*
*3C16671A Superstack II Hub 24 Port ..... *(799)*
*3C16700 TPO Office Connect Hub 8 Port ..... *(79)*
*3C16701 TPC Office Connect Hub (8TP+BNC) ..... *(129)*
*3C16702 Office Connect Hub (16TP+BNC) ..... *(215)*
*3C16703 Office Connect Hub 4TP Combo ..... *(89)*
*3C16704 Office Connect Hub 4TP ..... *(69)*
3C16720 Office Connect 100 Hub 8 Port 675
*3C16721 TP1200, 12 Port Fast Hub ..... *(495)*
*3C16722 TP800, 8 Port Fast Hub ..... *(339)*
*3C16723 TP400, 4 Port Fast Hub ..... *(199)*
*3C16731 Office Connect Switch Hub 140M ..... *(665)*
3C16733 4 Port 10/100 Switch 479
*3C16900A Switch 1000 24 Port 1 Fast ..... *(1595)*
*3C16901A Switch 1000 12 Port 1 Fast ..... *(1195)*
*3C16942A Switch 3000TX 10/100 12 Port ..... *(1595)*
3C16950 SSII Switch 1100 24 Port 1059
3C16951 SSII Switch 1100 12 Port 1399

NETSERVER:

*Netserver/8 Plus (#1877) ..... *(2795)*
*Netserver/8 I-Modem Plus (#1879) ..... *(3495)*

ALLIED TELESYN

3012TR Workgroup Hub (12TP+AUI+BNC) 165
3016TR Workgroup Hub (16TP+AUI+BNC) 189
3024TR Workgroup Hub (24TP+AUI+BNC) 249
MC12T UTP to BNC Conversion Kit 119
*MR415T Mini Hub 4 Port ..... *(49)*
*MR815T Mini Hub 8 Port ..... *(59)*
MR820TR Microhub 8 Port (8TP+AUI+BNC) 115
MX26F Fiber Optics Transceiver 145
MX40F Fiber Optics Transceiver 139

APOLLO

PCMCIA LAN Ethernet Adapter Combo 79

ARTISOFT

Extra Mail for Win'95 215
I-Share 2.5, 32 sessions (internet for Lantastic) 179
Lantastic 7.0 Single - CD / FD 85/89
Lantastic 7.0 10-user - CD / FD 355/385
Lantastic 7.0 1-user Add On 129
Lantastic 7.0 Starter Kit 2-user - CD+FD 249
Lantastic 7.0 Unlimited User - CD 725
NR-Pro 2000A Combo / 10-pk 85/755
NR-Pro 2000T TP / 10-pk 79/625

ASANTÉ

*10T Hub 8 Port (8TP+BNC) ..... *(99)*
*10T Hub 12 Port (12TP+1BNC+1AUI) ..... *(149)*
*10T Hub 24 Port ..... *(315)*
*Fast 100BaseTX 12 Port Hub, stackable ..... *(1475)*
*Fast 100BaseTX 12 Port Hub, PnP ..... *(1195)*

*(sale price) ..... SPECIALS, limited to stock on hand
Prices subject to change without notice.

http://www.centralcomputer.com for current prices & product catalog

NOTEBOOKS / PALMTOPS / WORKSTATIONS & SERVERS

Notebooks / Palmtops

3COM (US ROBOTICS)

Palm III (80300U)
< offer ends 7/12/98> ..... **(359)*
Accessories
(10119U) Stylus Pen 3-pk 8.50
(10126U) Cradle 29
Palm Pilot Professional 1MB ..... **(259)*
Accessories
(10101U) Slim Leather Case 25
(10108U) Pen 3-pk 7.99
(10109U) Cradle for Windows 29
(10117U) Belt Crib Case 24
(10264U) Deluxe Leather Case 58

CASIO

Cassiopeia E-10 4MB Handheld CE 2.0 389

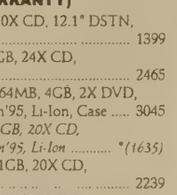
CHEM USA

Chembook 2600
P-233MMX, 32MB, 2.1GB, 20X CD, 12.1" TFT, Win'95, Li-Ion 1755
Chembook 2700
P-233MMX, 32MB, 2.1GB, 20X CD, 14.2" TFT, 4MB Video, Win'95, Li-Ion 2245
Chembook 3300
32MB, 2.1GB, 20X, 12.1" TFT, Win'95,
- w. P-166MMX 1495
- w P-200MMX 1519
- w. P-233MMX 1549
Chembook 6000
- IMM P-266MMX, 32MB SDRAM, 3GB, 20X CD, 13.3" TFT, XGA, Win'95 2719
- PII-266, 48MB, 3GB, 13.1" TFT, Win'95 3049
Chembook 7000
P-266, 64MB, 4GB, 15" TFT, Win'95 3235
Chembook 9780
- P-266, 32MB SDRAM, 2.1GB, 20X CD, 12.1" TFT, SVGA, Win'95, Li-Ion 2135
- P-233MMX, 32MB SDRAM, 3GB, 20X CD, 14.1" TFT, XGA, Win'95, Li-Ion 2349

DFI (1 YR ON-SITE WARRANTY)

6600: P-150, 16MB, 1.4GB, 10X CD, 12.1" DSTN, Win'95, Carrying Bag 1399
6630: P-233MMX, 64MB, 4GB, 24X CD, 13.3" TFT, Win'95 2465
6730DV: IMM P-266MMX, 64MB, 4GB, 2X DVD, 56k modem, 4MB VGA, Win'95, Li-Ion, Case 3045
8120: P-200MMX, 32MB, 2.1GB, 20X CD, 12.1" TFT, Video Capture, Win'95, Li-Ion ..... **(1635)*
8241: P-200MMX, 32MB, 2.1GB, 20X CD, 14.2" TFT, Win'95, Li-Ion 2239

DIGITAL EQUIPMENT (DEC)



HiNote VP735
P-233MMX, 32MB, 4GB, 20X CD, 13.3" TFT, XGS, Win'95 2829
HiNote VP745
(#FRPJ5WKAA)
P-266MMX, 32MB, 4GB, 20X CD, 13.3" TFT, Win'95
(FREE Port Replicator & 3 yr extended warranty, while supplies last) 3085

FUJITSU

Lifebook 635TX:
Ultra-Thin, P-133MMX, 16MB, 2GB, 33.6 modem, 12.1" TFT ..... **(1500)*
Lifebook 675TX
P-200MMX, 3.2GB, 32MB, 56k modem, 12.1" TFT, Win'95 2879
Lifebook 690TX
P-266MMX, 32MB, 4GB, 20X CD, 56k modem, 12.1" TFT, Win'95 3159
Lifebook 770TX
P-200MMX, 32MB, 3.2GB, 20X CD, 56k modem, 12.1" TFT, Win'95 <offer ends 7/12/98> ..... **(1745)*
Lifebook 790TX
P-266MMX, 32MB, 4GB, 20X CD, 56k modem, 12.1" TFT, Win'95 2415
Lifebook 985TX:
P-233MMX, 32MB, 5GB, 20X CD, 56k modem, 13.3" TFT, DSVD, Win'95 3255
Lifebook 990TX2:
PII-266, 32MB, 5GB, 24X CD, 56k modem, 13.3" TFT, Win'95 4299

HITACHI

VisionBook Traveller (#3745)
2.75lbs, P-133MMX, 24MB, 1GB, 8.4" TFT, Win'95, Li-Ion 1639
VisionBook Pro (#6390):
P-266MMX, 32MB, 3.2GB, 20X CD, 56k modem, 12.1" TFT, Win'95 2499
VisionBook Pro (#7590):
P-266MMX, 48MB, 4GB, 20X CD, 56Kx2 modem, 13.3" TFT, Win'95 2995

HEWLETT PACKARD

Authorized Reseller

NOTEBOOK:

Omnibook 3000CTX (F1392A):
P-233MMX, 16MB, 4GB, 13.3" TFT, XGA, Win'95, Li-Ion ..... **(2659)*
Omnibook 3000CTX (F1394A):
P-266MMX, 16MB, 4GB, 12.1" TFT, Win'95 2975
Upgrades for 3000CTX:
- 16MB module (F1363A) 79
- 20X CD Rom (F1387A) 249
- Port Replicator (F1381A) 215
- Zip Drive Internal (F1388A) 279
Omnibook 3100 (F1582W):
P-266MMX, 32MB, 4GB, 24X, 13.1" TFT, Win'95 3189
Omnibook 4100 (F1462W):
PII-233, 32MB, 4GB, 24X, 13.3" TFT, Win'95 3515
Omnibook 4100 (F1464W):
PII-266, 32MB, 6.4GB, 24X, 14.1" TFT, Win'95 ... 4919
Omnibook 5700CT (F1352A):
P-150MMX, 16MB, 2GB, 12.1" TFT ..... **(1579)*
Omnibook 5700CT (F1353A):
P-166MMX, 16MB, 2GB, 12.1" TFT ..... **(1825)*
Sojourn (F1340A):
P-233MMX, 64MB, 2.1GB, 20X, 12.1" TFT, W'95 5775

PALMTOP:

320LX (F1221A) 640x240, 4MB ..... **(295)*
Accessories
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- (F1223A) Synch Cable 16
- (F1224A) Spare Cable 32
- (F1225A) Stylus 12
- (F1227A) Leather Case 68
- 2MB CF Card / w. Adapter 79/99
- 4MB CF Card / w. Adapter 119/149
360LX (F1238A) 8MB ..... **(595)*
620LX (F1250A) Color 785
Windows CE Upgrade Kit (F1239A) 125

IBM

TP380ED (#2635-6AU):
P-166MMX, 16MB, 3GB, 8X, 12.1" TFT, Win'95. 2189
TP380XD (#2635FAU):
PII-266, 32MB, 5GB, 24X, 12.1" TFT, Win'95 3735
TP560:
P-133, 8MB, 2.1GB, 11.3" DSTN, Win'95, Case **(1499)*
TP600 (#264531U)
P-233MMX, 32MB, 3.2GB, 12.1" TFT, Win'95 2679
TP600 (#264541U)
PII-233, 32MB, 3.2GB, 24X, 56Kx2, 13" TFT 3815
TP600 (#264551U):
PII-266, 32MB, 4GB, 24X, 56Kx2, 13" TFT 4399
TP770 (#95491AU):
P-233MMX, 32MB, 5.1GB, 14.1" TFT, Win'95 4159
TP770E (#954851U):
PII-266, 32MB, 5.1GB, 14.1" TFT, Win'95 4299
TP770ED (#95495AU):
PII-266, 64MB, 8GB, DVD, 14.1" TFT, Win'95 5735

PSION

Palmtop Series 5 4MB 425
Palmtop Series 5 8MB 489

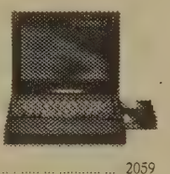
SHARP

Mobileon HC4500C:
Palmtop, Color, 16MB, 33.6 modem 929
Accessories (for HC4500C):
- Digital Camera 309
- Docking Station 125

TOSHIBA

Libretto 70CT:
P-120, 16MB, 1.58GB, 6.1" TFT, Win'95, Li-Ion 1669
Libretto 100CT:
P-166MMX, 32MB, 2.1GB, 7.1" TFT, Win'95 2455
Portege 300CT:
P-133MMX, 32MB, 4GB, 33.6 modem, 10.4" TFT, Win'95 1689
- Multimedia Port Replicator (for 300CT) 425
Portege 320CT:
P-266MMX, 32MB, 4GB, K56 modem, 10.4" TFT, Win'95 3235
Satellite 320CDT (PA1271U-T2U):
P-233MMX, 32MB, 4.1GB, 20X, K56 modem, 12.1" TFT, Win'95 <offer ends 7/12/98> *2249*
Satellite 330CDT:
P-266MMX, 32MB, 4GB, 20X, K56 Flex modem. 12.1" TFT, Win'95, Li-Ion 2475
Satellite Pro 490CDT:
PII-233, 32MB, 4GB, 20X CD, K56 modem, 12.1" TFT, Win'95 2945
Satellite Pro 490XCDT:
PII-266, 32MB, 4GB, 20X CD, K56 modem, 13.3" TFT, Win'95 3415
Tecra 780CDM:
PII-266, 64MB, 5GB, Camera, 20X CD, K56 modem, 13.3" TFT 4965
Tecra 780DVD:
PII-266, 64MB, 5GB, Camera, DVD, K56 modem, 13.3" TFT 5375

TWINHEAD



Slimnote 9TE200TZ:
P-200MMX, 32MB, 2.1GB, 20X CD, 12.1" TFT, Win'95, Li-Ion 1649
Slimnote EX200TG:
P-200, 32MB, 3GB, 20X CD, 1024x768, 13.3" TFT, 4MB VGA, Win'95, Li-Ion 2059
Slimnote EX233TG:
P-233, 32MB, 3GB, 20X CD, 1024x768, 13.3" TFT, 4MB VGA, Win'95, Li-Ion 2159
Slimnote EX266TG:
P-266MMX, 32MB, 3GB, 20X CD, 13.3" TFT, Win'95, Li-Ion 2329
Slimnote EX2-233TG:
PII-233, 32MB, 3GB, 20X CD, 13.3" TFT, Win'95, Li-Ion 2439
Slimnote EX2-266TG:
PII-266, 32MB, 3.2GB, 20X CD, 13.3" TFT, Win'95, Li-Ion 2755
Slimnote XL200TK:
P-200, 32MB, 3GB, 20X CD, 14.2" TFT, XGA, Win'95 2225
Slimnote XL233TK:
P-233, 32MB, 3GB, 20X CD, 14.2" TFT, XGA, Win'95 2319
Slimnote XL266TK:
P-266MMX, 32MB, 3GB, 20X CD, 14.2" TFT, Win'95, Li-Ion 2495

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Franklin Electronics: Rolodex REX-3 w. REX-DS Docking Station 169
Kensington: Deluxe Carrying Case 28.95
Kensington: Desktop MicroSaver 19.95
Kensington: MicroSaver for notebook ..... **(35.95)*
Kensington: Saddle Bag ..... **(59.95)*
Pacific Oversea: SB-510 Black Leather Case 13" 39
Pacific Oversea: SB-3301 Deluxe Leather Bag 65
Pacific Oversea: SB-3302 Standard Leather Bag 55
Targus: Leather Convertible Backpack (CLC-1) 85
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Targus: Universal Carrying Case (CUN-1) ..... **(55)*
Targus: Universal Air Carrying Case (CUN-1A) 66

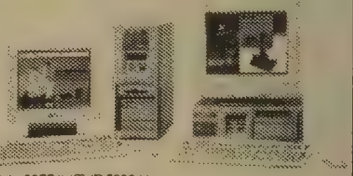
Workstations / Servers

DIGITAL

PC-3500MT (FR-F286A-TB):
- PII-300, 32MB, 4.3GB, 32X, 2MB VGA, Win'95 . 1579

HEWLETT PACKARD

• MT=Tower • DT=Desktop



Brio 8377/MT (D5833A):
PII-266, 32MB, 8GB, 32X CD, USR 56k modem, Win'95 1695
Brio/MT (D5834A):
PII-333, 64MB, 8GB, 32X CD, 56k modem, Win'95 2095
Brio/MT (D5845A):
PII-233, 32MB, 4GB, 24X CD, 56k modem, Win'95 1519
Brio/MT (D6513A):
PII-300, 32MB, 8GB, 32X CD, Win'95 1649
Brio 8334/MT (D6662T):
Celeron 266, 32MB, 4GB, 24X CD, Win'95 1149
Kayak XA/MT (D4806N):
PII-233, 32MB, 2.5GB, 24X CD, 10/100BT, Win NT 4.0 1669
Kayak XA/MT (D4808T):
PII-266, 32MB, 4.3GB, 24X CD 10/100BT, Win NT 4.0 1645
Kayak XA/MT (D6419T):
PII-300, 64MB, 6GB, 24X CD, 10/100 NIC, Win NT 2019
Vectra VE4 (D5609T):
P-200MMX, 32MB, 3.2GB, 24X CD, Win'95 1279
Vectra VE4 (D5619T):
P-233MMX, 32MB, 3.2GB, 24X CD, Win'95 1389
Vectra VL7 (D5726T):
PII-266, 32MB, 4.3GB, 24X CD, Win'95 1419
Vectra VL7 (D5739T):
PII-333, 64MB, 6.4GB, 24X CD, Win NT 2199

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E45/MT (D4974A):
PII-233, 32MB, 512k, 4.2GB SCSI, 24X CD, 10/100 NIC 1839
E50/MT (D6033A):
PII-300, 64MB, 4.2GB UW-SCSI, 24X CD, 10/100 NIC 2039

HITACHI

VisionDESK (#1120) - all-in-1 LCD Desktop:
P-233MMX, 32MB, 4.3GB, 20X CD, 56Kx2 modem, 13.3" TFT, 10/100BT, Win'95 2479

TOSHIBA

• D=Desktop • M=Tower

Equium 100 (PV1038U) - built-in 15" LCD -
#0001: PII-266, 32MB, 3GB, 16X, 10/100 NIC, Win'95 2995
#0004: PII-300, 64MB, 4GB, 16X, 10/100 NIC, Win'95 3365
Equium 7000D (PV1044U-844F):
PII-300, 32MB, 4GB, 24X, Win NT, NIC 1565
Equium 7100D:
PII-350, 64MB, 4GB, 32X, 10/100 NIC, Win'95 .. 2449
Equium 7100D:
PII-400, 64MB, 6GB, 32X, 10/100 NIC, Win NT . 2739
Equium 7100S (PV1045U-32P00):
PII-350, 64MB, 6GB, 32X, NIC, Win NT 2469
Equium 7100S (PV1045U-FCP00):
PII-400, 128MB, 8GB, 32X, NIC, Win NT 3075

NO Returns. Only Satisfaction Warranty from Manufacturers.

**(sale price)* *SPECIALS, limited to stock on hand*
Prices subject to change without notice

http://www.centralcomputer.com for current prices & product catalog

ASCEND (FREE FIREWALL SOFTWARE)

P15-1UBRI: ISDN	*(249)
P25-1U-FX: ISDN Pipeline 25 + 4 Ethernet	*(435)
P25-1U-PX: ISDN Pipeline 25 + IP Routing	*(499)
P50-1UBRI: ISDN Pipeline 50	*(535)
P75-1UBRI: ISDN Pipeline 75	*(625)
P130-1UBRI-FT1: ISDN	*(1199)

Bay Networks

CG1001E01: Bay Stack 12 Port	599
CG1001E02: Bay Stack 24 Port	975
CG1001E08: Bay Stack 4 Port + BNC	*(85)
CG1001E09: Bay Stack 8 Port + BNC + AUI	175
Lattislink 2800A: 16TP + 1AUI	559
Lattihub 2803: 16TP + 1AUI, stackable	599
NetGear FE108: 8 Port 100 Hub, non-stackable	375
NetGear FE508: 8 Port Fast 100 Hub	549
NetGear FE516: 16 Port Fast 100 Hub	685

CASTELLE

FaxPress 1500N Ether 1 Line for NW & NT	1995
Office Connect CD Rom Server	569
Office Connect Ether 2P Printer Server	*(299)
Office Connect Ether 1 Line Fax Server	1195

CHEYENNE

Arc Serve 6.1 for Netware Enterprise	1095
Arc Serve 6.5 for Win NT 4.0 Single Server	415
Arc Serve 6.5 for Win NT 4.0 Enterprise	739
Arc Serve 6.5 for Win NT Workstation	99
Arc Serve for MAC - 5 / 20-user	159/309
Arc Solo Backup software for Dos / Win	119/118
Fax Server NLM 5.0:	
- 5 / 10 / 25-user	355/639/999
Inoculan for Netware Server 4.0 Unlimited	*(495)
Inoculan for Win'95 (Anti-Virus)	45
Inoculan for Win NT Server	575
Inoculan for Win NT add-on Arc Serve	*(279)
Inoculan for Win NT Workstation Client	46

CISCO SYSTEMS

1528: Microhub 8 Port 10/100	479
CPA-762 ISDN BRI w. NT1	525
CPA-1604 Bridge w. NT1	1295
CPA-2501 Router 1 Ethernet 2 Serial	1695
Catalyst W'S-C1900: 24TP, 2BTX	*(1399)

CNET

2000E+ ISA Combo PnP	27
8800TPC Hub (8TP + BNC)	*(65)
8816TPC Hub (16TP + BNC)	*(125)

D-LINK

DFE-904 10/100 4 Port Hub	89

DANPEX

2000PNP ISA Combo	*(17)
2900PT PCI RJ45	*(15)
2900P2 PCI Combo	*(18)
6200P2 PCMCIA (type II), BNC + TP	*(59)
EN-500 5 Port Hub TP	*(39)
EN-1600 16 Port Hub R.M.	*(99)
EN-3200 32 Port Hub R.M.	255
ER-200 2 Port Repeater Coax	159
ER-400 4 Port Repeater Coax	249
ET-109 Converter (10BaseT to BaseFL)	169
ET-509 Translator (UTP to BNC)	109
ET-510 Translator (UTP to AUI)	107
FE-1439TX PCI 10/100BaseTX	*(28)
Fast Ethernet Starter Kit	*(165)
(Fast 4 Port Hub + 2 PCI 100TX + 2 Cable cat. 5 TP 15')	

HEWLETT PACKARD

J1120AA Network Node Manager for NT	3345
J2550B Jet Direct TP	279
J2552B Jet Direct Combo	345
J2556B Jet Direct 10/100 Combo	*(385)
J2573A 10/100 VG Selectable ISA	169
J2585A 10/100 VG Selectable PCI	135
J2590A Jet DirectEX Plus 3 for 100VG	549
J2591A Jet DirectEX Plus Combo	*(235)
J2592A Jet Direct 150X TPO	165
J2593A Jet DirectEX Plus 3 Combo	325
J2610B Advanced Stack 8 Port Hub	245
J3110A Jet Direct TP for 4000	235
J3111A Jet Direct Combo for 4000	279
J3113A Jet Direct 10/100 for 4000	*(299)
J3128A Advanced Ethernet 8E Hub	135
J3175A AdvanceStack Switch 208T	779
J3200A AdvanceStack Switching 12 Port	425
J3201A (J3200A) + SMNP (J3210A)	*(499)
J3202A AdvanceStack Switching 24 Port	825
J3203A (J3202A) + SMNP (J3210A)	*(799)
J3245A Advancestack Switch 800T	1515

IBM

Token Ring 16/4 Turbo ISA (72H3482)	245
Token Ring PCMCIA 16/4 Auto	325

intel SALE

EE110TX 8 Port Fast Hub, non-stackable	459
EE110TX 12 Port 10/100 Hub	*(799)
EE110TX 24 Port 10/100 Hub	*(1065)
EILA 8265 Pro/100 for EISA	*(199)
ES101-TX Switching Hub 10/100	*(2099)
EtherExpress Pro/10 Cards:	
- PCLA 8210 BNC+TP oem / reg	*(65/95)
- PCLA 8220 TP	*(89)
In-Business 8 Port Hub	85
MBLA 1600 PCMCIA 10/100	*(149)
PCLA 2451 Netport Express Pro/100 Ext, 3 Port	375
PCLA 3151 Netport Express Pro Int	295
PCLA 4451 Netport Express Pro/100 Ext, 1 Port	275
PILA 8460 Pro/100+oem	*(59)
PILA 8480 Pro/100 Server Adapter	325

KINGSTON

Etherx 10BT PC Card	95
Etherx 10/100 Fast PCI	59

LANPRO SALE

Auto Sensing Hub 10/100 8 Port	225
EN2000PXA Full Duplex Combo PnP	*(18)
EN5200PX PCI Combo	*(19)
EN9130TX 10/100TX PCI Card	*(29)
ER1204TX Fast HUB 4 Port	*(85)
ER1208TX Fast HUB 8 Port	*(169)
Fast 100 Hub 5 Port Stackable	*(225)
Fast 100 Hub 8 Port Desktop / Stackable	*(335/425)
Hub 5 Port (5TP)	*(49)
Hub 8 Port (8TP+BNC)	*(59)
Hub 16 Port (16TP+BNC) Desktop	*(99)
Internet Access Server 1 Port / 2 Port	179/215
PS1000A Print Server Single Port	109
Print Server 10/100 3 Port	239

LINKSYS

10 Port Switch (2 Fast + 8TP)	545
Ether Fast 10/100 PCI Card	39
Ether Fast 10/100 PCMCIA	109
Fast 100TX 4 Port Hub Stackable	*(125)
Fast 100TX 5 Port Hub	99
Fast 100TX 8 Port Hub / Stackpro	179/289
Fast 100TX 16 Port Hub Stackpro	575
Fast Switch 10/100TX 2 Port	189

MEGAHERTZ

3CCFEM556 56k modem + 10/100BT	319
3CCFEM556B v.90 56k + 10/100BT	369
3CXEM556T 56k modem + 10BT	275
3CXEM556BT v.90 56k modem + 10BT	295

MICRODYNE

EH800E 8 Port Hub	*(119)
EH1200E 12 Port Hub	*(175)
NE 10/100 PCI	*(99)
NE2500 ISA Combo PnP	*(13)
NE5500 32-bit Combo PCI	*(109)

MIROTEST

CD-Now for Netware - 25 / 50-user	489/695
Disc View Pro	265
Disc Serv (includes Disc View)	529

NOVELL

Intra Netware 4.11:	
- 5 / 10 / 25-user	*(695/1295/2095)
- 50 / 100 / 250-user	2895/3995/7295
- 500 / 1000-user	15995/30995
Intra Netware 4.11 Addition 10-user	895
Intra Netware for Small Business:	
- Server + 5 License	659
- 1 / 5-user License	59/225
Lan Workplace 5.0 - Single / 10-user	195/1295
Netware Connect - 2 / 8 / 32-Ports	355/1375/3895
Netware Management Agents 2.1	415
Netware NFS v1.2C	*(1850)
Netware NFS Service 2.1	2195
NFS Client for Lan Workplace	205

RAYLINK

Access Point (500ft - 1000ft) + Lan Card	1150
PCMCIA Wireless LAN Card	425
RIS-100 PC Card Adapter	39

SHIVA

LanRover/2E Plus 3.5 Async TP v.34	1695
NetModem/E 28.8 Ether BNC + TP	1295

SMC SALE

Ether EZ TP ISA (8416T) oem	*(58)
Elite Ultra 32 EISA Combo	*(195)
Etherpower PCI Combo (8432BT) oem	*(75)
Etherpower II 10/100 (9432TX) oem	*(56)
EZ Hub 100TX 8 Port	635
Tiger Hub 100TX 12 Port	1195
Tiger Hub 3212TC (12TP+BNC+AUI)	349
Tiger Hub 3314T 14 Port	*(399)

WISECOM (5 YR WARRANTY)

H008CAT 8 Port Hub (8TP+AUI+BNC)	*(64)
HI16CAT 16 Port (16TP+AUI+BNC)	*(139)
R310CT PCI 32-bit Combo PnP	*(1995)
U210T NE2000 ISA Combo PnP	16

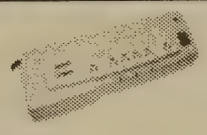
Xircom

CE3-10BC PCMCIA Combo	159
CE3-10BT TP, upgradable	135
CE3B-100BTX 10/100 PCMCIA	155
CEM33-BC 33.6 modem + LAN Combo	*(299)
CEM33-BT 33.6 modem + LAN TP	*(255)
CEM156-100BTX 56k modem + Fast LAN	*(315)
CEM56-100MD: with Mini Dock	*(305)
REM56G-100BTX Realport 10/100 + 56k PCMCIA	339.95

CABLES & ACCESSORIES:

10BaseT, Cat. 3 plenum 1000'	145
Belden 8259, RG58 1000'	135
RG58 U - 500' / 1000'	49/79
RG58 A/U - 500' / 1000'	59/99
Twisted Pair 2-pair, PVC, Cat. 3 - 500' / 1000'	25/45
Twisted Pair 4-pair, PVC, Cat. 3 - 200' / 500' / 1000'	25/45/69
Twisted Pair 4-pair, PVC, Cat. 5 - 200' / 500' / 1000'	30/59/95
Custom-made Cables, Cross-Overs	**Call**

15. POWER SUPPLIES



APC

BF-250 Back-UPS Office Kit	*(99) 115
BK-300 Back-UPS (180W), 2 out	99
BK-500M Back-UPS (330W), 2 out	155
BK-600 Back-UPS (425W), 4 out	225
BK-650M Back-UPS (400W), 3 out	199
BP-280 Back-UPS Pro PnP, 2 out	139
BP-420 Back-UPS Pro PnP, 4 out	225
BP-420S Back-UPS Pro	225
BP-650S Back-UPS Pro, 3 out	279
BP-1000 Back-UPS Pro (670W), 6 out	375
ShareUPS AP9207	235
SU-420 Net	235
SU-620 Net, 4 out	285
SU-700 Smart-Net (486, 586, FS), 4 out	365
SU-1000 Smart-Net (FS, WS), 6 out	475
SU-1400 Smart-Net (950W), 6 out	625
SU-2200 Smart-Net (1600W), 8 out	899
SU-3000 Smart-Net (2250W), 8 out	1645
SU-1000 RM Net / SU-1000XL Net	575/599
SU-1400 RM Net	739
SU-2200 RM 3U / SU-2200XL Net	1235/1195
SU-3000 RM 3U	1799
Powerchute Plus:	
- for Novell	65
- for OS/2, LAN Server, 3Com	75
- for Unix / Xenix	99
- for Win & Win'95 / Win NT	55/69
PNote1 Surge Arrest (for notebooks)	19.95
Surge Arrest (PER 7)	17.99
Surge Arrest w. TEL (PER 7T)	22.99
Surge Network Strip (NET 7)	29.95
Surge Network Strip (NET 7T)	39.95
Surge Protector (P7)	9.99
Surge Station Net 8 / 8N	36/48
Surge Station Pro 8 / 8T2 / 8TV	32/39/49

PC POWER COOLING

CPUcool for Pentium® Pro (3.2")	20.95
CPUcool K1 for Pentium® II up to 450MHz	19.95
CPUcool Z1 for P-233 to P-333 (socket 7)	19.50
Silencer 230 Slim for Baby or Mid Tower	69
Silencer 230 for Full Tower	79
Silencer 235 ATX	84
Silencer 270 for Full Tower	115
Silencer 270 Slim for Baby or Mid Tower	108
Silencer 275 ATX	124
Turbo Cool 300 ATX	126
Turbo Cool 300 for Full Tower	116
Turbo Cool 300 Slim for Baby or Mid Tower	109
Turbo Cool 400 ATX	189
Turbo Cool 400 Slim / for Full Tower	*(169/176)
Turbo Cool 600 for Full Tower	335
Two-in-1 500 (slim, redundant)	199
Twinpower 800 for ATX (redundant)	695

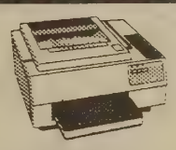
OTHERS

250W for ATX	39
250W for Baby or Mid Tower, PS/2	35
300W UL for Full Tower, PS/2	45
300W for ATX UL	75
Kensington Compact Power Center (220 Joules)	49
Kensington Masterpiece Plus Control Center	89
Kensington Masterpiece Power Office Center	75
Kensington SmartSockets Basic Strip, 370 Joules	14.99
Kensington SmartSockets Premium, 520 Joules	22.99

ACCESSORIES:

Battery Tester M-032	6.50
DMM: DT-890B (A,V,O,C,Hfe)	19.95
DMM: DT-830B (Adc,V,O,Hfe) pocket size	8.95
DMM: M-3900 (A,V,O,Hfe) big LCD	17.95
DMM: KT-7113 (A,V,O,C,Hfe) auto ranging	24.95
DMM: KT-7244 (A,V,O,F,Hfe)	21.95
DMM: ST-5308 (Adc,V,O,Hfe) battery test	11.95
Engine Tester KT-7181 (Dwell, Tacho)	18.95
Pocket Meter MF-133, 5 functions	6.95
Power Center Switching Systems	13.50
Test Probe / Tool Kit	1.99/7.95

16. PRINTERS & PLOTTERS



AVERY (ACCESSORIES)

#3110 Kids Rectangle Stickers	4.99
#3111 Kids Square Stickers	4.99
#3112 Kids Small Round Stickers	4.99
#3113 Kids Big Round Stickers	4.99
#3114 Kids Full Page Stickers	4.99
#3265 Greeting Cards Half-Fold	6.95
#3610 Kids Greeting Cards	5.45
#3611 Kids Post Cards	5.45
#3613 Kids Laminated I.D. Cards	5.95
#5610 Laser Printer Label 100pk (1"x2.6")	22.95
#5163 Laser Printer Label 100pk (2"x4")	23.95
#5267 Laser Printer Label (0.5"x1.75")	8.95
#8162 Inkjet White Address Label (1.33"x4")	4.79
#8167 Inkjet Return Address Label (0.5"x1.75")	4.75
#28371 Inkjet White Business Cards 10pk	4.69

BROTHER

HL-730DX True 600dpi, 6ppm, Laser	*(199)
MFC-4550 5-in-1, 600dpi, Laser, Fax	699
MFC-6550 6-in-1, Fax/ Copy/ Scan/ Print etc.	969
MFC-7000FC 6-in-1 Fax/ Copy/ Scan etc.	979

Canon

BJC-80 Color	285
BJC-250 Color	159
BJC-4300 Inkjet, Color	199
BJC-4304 Photo Color Inkjet	229
BJC-4550 720x360dpi, 5ppm, 11"x17"	285
BJC-7004 Color	335

EPSON

FX-880 9-pin	295
FX-2170 9-pin, Wide, max. 6 copies	449
LQ-570+ 24-pin	259
LQ-870 24-pin, Par	455
LQ-2070 24-pin, Wide	*(359)
LQ-2170 24-pin, Wide	549
Stylus 400 Color, 720dpi, 3ppm	*(149)
Stylus 600 Color, 720x1440dpi, 6ppm	*(199)
Stylus 700 Photo Color, fit 8.5"x44"	275
Stylus 800 Color, 720x1440dpi, 8ppm	*(249)
Stylus 850 Color, 1440x720dpi	365
Stylus 850N w. Ethernet Card	545
Stylus 1520 Color, 1440x720dpi, fit 17"x22"	759
Stylus 3000 Color, 1440x720dpi, fit 13"x19"	1699
Stylus Photo (C209011), 720dpi	*(219)
Stylus PhotoEX fit 11"x44"	479

Accessories:

(C823121) Local Talk for Stylus	145
(C823572) Multi-Ethernet for LQ & Stylus	325

Epson Ink Cartridges:

Black Ink for II & IIS (SO20047)	19.95
Black Ink for 400/ 500/ 600/ 700/ PhotoEX	19.45
Black Ink for 400/ 800+ (SO20025)	10.95
Black Ink for 800 / 850/ 1520 Color (SO20108)	22.45
Color Ink for II & IIS (SO20049)	29.95
Color Ink for 400/ 600/ 800/ 850/ 1520	22.95
Color Ink for Stylus Photo/ EX/ 700 (SO20110)	19.95

Epson Paper:

Banner Kit for 1520 (C811011)	31.95
Banner Paper for 1500 (SO41102)	25.95
- Banner Paper Holder for 1500 (C811003)	24
Coated 720dpi Paper Letter (SO41062), 100 sheet	12.95
High Quality Glossy Paper (SO41072), 15 sheet	24.95
High Quality Inkjet Letter (SO41111), 100 sheet	8.95
Iron-On Paper (SE41001), 10 sheet	12.95
Photo Quality, 4x6, (SO41134), 20 sheet	7.45
Photo Quality, 11x17 (SO41070), 100 sheet	26.95
Photo Quality Glossy (SO41124), 20 sheet	10.95

(sale price) ..... SPECIALS, limited to stock on hand
Prices subject to change without notice

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Photo Quality Glossy 11x17 (SO41075), 10 sheet 38.95
Photo Quality Glossy 13x19 (SO41074), 10 sheet 49.95
Photo Quality Legal (SO41067), 100 sheet 17.45

HEWLETT PACKARD

Color Laser Jet 5 (C3961A) 3875
Color Laser Jet 5M (C3962A) 4945
Deskjet 670C (C5884A) 208
Deskjet 692C 245
Deskjet 720C 289
Deskjet 890CXi 379
Deskjet 1000CXi (C2673A), fit 4x6 - 11x17 395
Deskjet 1120CXi (C2680A), fir 4x6 - 13x19 479
Deskjet 1600C for PC & MAC 1279
Deskjet 1600CM Postscript for PC & MAC 1869
Deskjet 2000CXi (C4530A), 10ppm 759
Laser Jet 4MV (B size) 2595
Laser Jet 5 / 5M / 5N 999/1525/1285
Laser Jet 6LXi ..... *(377)
Laser Jet 6PXi / 6MP 745/879
Laser Jet 3100Xi (C4177A) All-in-1 ..... *(659)
Laser Jet 4000 (C4118A), 2 trays 1099
Laser Jet 4000N (C4120A) JetDirect 1415
Laser Jet 4000T (C4119A), 3 trays 1235
Laser Jet 4000TN (C4121A) JetDirect 1545
Laser Jet 5000 (C4110A), print size 11"x17" 1445
Laser Jet 5000N (C4111A), print size 11"x17" 1995
Laser Jet 8000 (C4085A), 24ppm 2345
Laser Jet 8000N (C4086A), fit 11.7x17.7 2599
Mopier 5Si (C4176A) / w. Bundle 4445/6545
Office Jet 590 (C4645A) 4-in-1 399
Office Jet 630 (C5315A) 4-in-1 519
Office Jet Pro 1150C Color (C5300A) ..... *(699)
Portable 340 (C2655A) 265
Portable 340CBi (C2671A) w. Infrared Adapter 299

HP PLOTTERS:

Design Jet 430: D Size (C4713A) 1675
Design Jet 430: E Size (C4714A) 2495
Design Jet 450C D Size (C4715A) 1995
Design Jet 450C E Size (C4716A) 2895
Design Jet 750C+: D Size / E Size 4995/5695
Design Jet 755CM: E Size 8195
Design Jet 2000CP E Size (C4703A) 8295
Design Jet 2500CP E Size (C4704A), Ethernet 9995

Accessories:

C3169A: Postscript for 5Si 435
C3760A: Lower Cassette for 4V/ 4MV 325
C3762A: Duplex for 5Si/ 5SiMX 479
C3765A. Envelope Feeder for 5Si 379
C3920A: Duplex for 5/ 5N/ 5M 475
C3921A: 500 Sheet Feeder for 5 225
C4113A: Duplex for 500 399
C4115A: 500 Sheet Feeder for 5000 285
C4122A: Power Envelope Feeder for 4000 265
C4123A: Duplex for 4000 289
C4124A: 500 Sheet Feeder Universal Tray 269
C4137A: 16MB for 4000 145
C4781A: 2000 Sheet Tray for 8000 865
C4782A: Duplex for 8000 399

HP Ink Cartridges:

51625A: Color for 500C/ 550C/ 560C 26.95
51626A: Black for 500/ 540/ 560 ..... 24.45
51629A: Black for 590/ 600/ 660 ..... 24.95
51640A Black for 1200C 23.95
51640C: Cyan for 1200C 27.95
51640M: Magenta for 1200C 27.95
51640Y: Yellow for 1200C 27.95
51641A: Color for 870C/ 855C/ 1600C 28.95
51645A: Black for 870C/ 855C/ 1600C 26.95
51649A: Color for 590/ 660C 29.25
C1816A: Color Photo Ink for 692C 28.95
C1823A: Color for 720C/ 890C 32.95
C3102A: Cyan for Color Laser Jet 32.95
C3103A: Yellow for Color Laser Jet 32.95
C3104A: Magenta for Color Laser Jet 32.95
C3105A: Black for Color Laser Jet 7.95

HP Paper:

92296T: Transparency Film for Laser Jet, Letter .. 17.95
C1812A: Greeting Card, Letter, 20 sheet 7.95
C1846A: Photo Paper, Letter, 20 sheet 8.45
C1852A: Premium Heavyweight, 100 sheet 13.45
C2974A: Glossy, Letter, for 5/ 5M, 50 sheet 39.95
C3850A: Opaque Bond, 36"x150' roll 24.95
C3877A: Coated Paper, 36"x150' roll 39.95
C5973A: Premium Glossy, Letter, 25 sheet 21.95
C5976A: Bnght White Inkjet, Letter, 200 sheet 5.95
C6093A: Premium Photo 4"x5", 15 sheet 8.50

HP Toner Cartridges:

92274A: for 4L/ 4ML/ 4P 65
92275A: for IIP/ IIP+/ IIIP 74
92291A: for IIISi/ 4Si/ 4SiMX 129
92295A: for II/ IID/ III/ IIID 75
92298A: for 4/ 4M/ 4+/ 4M+/ 5/ 5M/ 5N 89
C3900A: for 4V/ 4MV 139
C3903A: for 5P/ 5MP/ 6P/ 6MP 75
C3906A: for 5L/ 5ML/ 6L 59
C3909A for 5Si/ 5SiMX 179
C4127A: for 4000 ..... 79.95

LEXMARK

1000 Color Jet ($40 Rebate) 115
Optra C Color, 600dpi, Postscript, 8MB, 3ppm 4495
Optra E 600dpi, 1MB, 6ppm 395
Optra S1250 1200dpi, 4MB, 12ppm 1045
- with LAN (S1250N) ..... *(1245) 1299
Optra S1650 1200dpi, 4MB, 16ppm 1295
- with LAN (S1650N) 1545
Optra S2450 1200dpi, 4MB, 24ppm, fits 11x17 ... 2295
- with LAN (S2450N) 2595

NEC

SALE

Superscript 660+ Laser ($30 Rebate) ..... *(249)
Superscript 750C Color ($30 Rebate) ..... *(189)
Superscript 860 Laser ($50 Rebate) ..... *(389)
Superscript 1260 Laser, 600dpi, 12ppm ..... *(645)

OKIDATA

ML184T 9-pin, Par, 300cps, max. 5 copies 235
ML320T 9-pin, 290cps, max. 5 copies ..... *(315)
ML390T 24-pin, 312cps, for Win & Win 32 345
ML520 9-pin, 430cps ..... *(385)
ML590 24-pin, 450cps, max. 5 copies 449
ML591 24-pin, Wide, max. 5 copies 625
Office 44 4-in-1 ..... *(485)
OkiJet 2020 600dpi 185
OkiPage 4W Laser, 4ppm ..... *(199)
OkiPage 6E 600dpi, 6ppm ..... *(289)
OkiPage 6EX 600dpi, 2MB, 6ppm ..... *(399)
OkiPage 16N Laser, 600dpi, 16ppm 889
OL810E Laser, 600x1200dpi, 8ppm ..... *(565)
OL1200 Laser, 600dpi, 2MB, 12ppm ..... *(949)

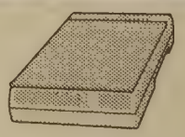
SEIKO

Smart Label Printer EZ30 145
Smart Label Printer Pro SLP220 235

TEKTRONIX

Z350/X Phaser 350 Color 2545
Z360/X Phaser 360 Color 3695
Z560/A Phaser 560 Color 3995

17. SCANNER



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EPSON

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Paperport 6100 Flatbed 36-bit Parallel 195
Paperport Strobe Sheetfed Parallel 195
Paperport Strobe Sheetfed Serial 195
Paperport Deluxe v5.3 for Win 32 (software) 45.95

18. TAPE BACKUP

AIWA

GD-B8000 8GB DDS-2 4mm SCSI Int 649
TD-S3200 TR-3 3.2GB Int 125

EXABYTE

Eagle TR3 603003-00a 3.2GB Int ..... *(145)
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Eliant 820S 8mm 7-14GB, Single Ended Ext 1775
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C1599 Dat. 8GB DDS-2 Int 695
- w. Int Kit (C1528) / Ext Kit (C1529) ..... *(875)/1095
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C4361A Colorado 5GB Ext 255
C5644C Surestore T4i 4GB Int 359
C5645B Surestore T4e 4GB Ext 459
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iomega

Ditto Max 7GB Int / Ext 185/179

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Seagate

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Back Up Exec for Win NT Workstation 189
Back Up Exec for Win NT Enterprise 7.0 865
Back Up Exec for Win NT Server 7.0 439

SONY

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WanBacker 7000: 8GB DDS-2 w. ArcServe Enterprise Int / Ext 1695/1795
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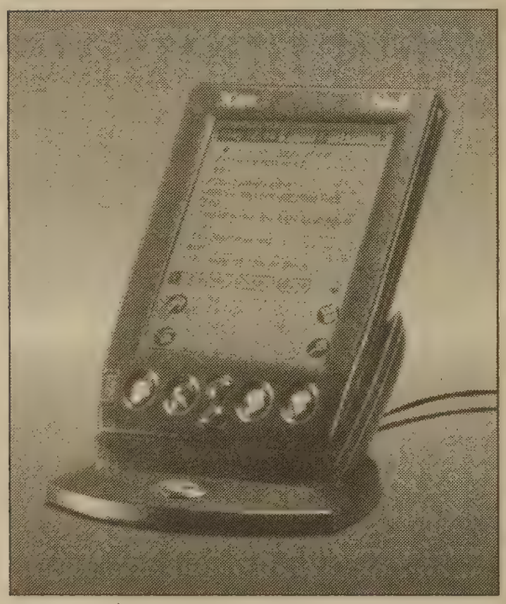
Palm III

The Next Generation From 3Com

By Douglas J. Nakakihara

3Com's eagerly-awaited new Palm III is for the most part worth the wait.



3Com's eagerly-awaited new Palm III is for the most part worth the wait, with a more elegant form factor, new applications, and much-improved file sharing capabilities among the best new features.

What's New?

Essentially identical in size to the Pilot, the Palm III appears smaller thanks to tapered sides and a sloping button area. A new spring-loaded door hides the previously-exposed cradle contacts; the new device retains compatibility with the PalmPilot modem.

The stylus has been moved from the side to the rear to make way for the new flip-top protective cover, which essentially replaces the now unnecessary soft case. (Note that the new location makes the stylus inaccessible when using "clamp-on" devices, like the Novatel Wireless Minstrel.)

The new plastic-tipped metal stylus is much easier to write with than its predecessor—it won't fit the holders on Pilots, but can be used with them.

The all-new infrared (IR) port at the top-rear of the unit lets you "beam" data to other IR-equipped Pilots within three feet (some reports suggest that significantly greater distances are possible). The new hotsync cradle is functionally equivalent to the old version, but you can't fit a PalmPilot in it. A Palm III will work—albeit with a wobble—in the old cradle.

The Palm III doubles the PalmPilot Professional's memory with 2MB (actually 1952K) of storage. Onboard flash memory allows future system software upgrading without replacing the entire memory card, as was previously required. One downside of this change is that the old easy-access memory door is gone.

While some applications have been enhanced—e.g. more data transfer options, another available font, and better organizational capabilities—the changes are incremental rather than radical.

File linking is an especially cool new feature—it allows users to automatically import data from a file on a PC each time the organizer is synchronized with the desktop. The file can be in comma-delimited, Palm Memo Pad/Address Book, or text format, and can be sent to either the Memo Pad or Address book. This is useful for keeping company phone lists and the like current. The application installation program has also been changed to allow multiple selections of Palm applications in a single dialog box—a welcome feature.

Also included is a CD-ROM from MacMillan Digital Publishing, with an assortment of applications—a financial calculator, world clock, Web channel manager (AvantGo), drawing program, conduits to leading desktop PIMs like Symantec ACT! and Microsoft Outlook 97, plus an assortment of games.

Things that haven't changed, and possibly should have: the backlit display still suffers from a nasty glare, though the display contrast wheel has been recessed to make it less easy to move by accident. Also, there's no speed increase, as the Palm III continues to use the same exact CPU, the Motorola MC68328.

Upgrading From Pilot

Owners of PalmPilot, Pilot 1000 and Pilot 5000 can get Palm III functionality, including 2MB of memory, infrared beaming capabilities and the Palm OS 3.0 software for $129. This also gives Palm Mail and expense tracking applications to Pilot 1000, Pilot 5000, and PalmPilot Personal users. (The Pilot 1000/5000 organizer $75 trade-up to a Palm III rebate ended June 30.)

Installation of the upgrade card is reputedly simple, requiring no tools. You just replace the original memory cover and card with new ones. The new memory cover contains the IR window.

A useful application if you're upgrading from Pilot is DB Explorer by Katsuhiro Endo. This shareware app lets you set the back-up bit for all files, including applications. (Normally, only database files are backed up when you hotsync.) This lets you mirror the entire memory contents of your Pilot to your PC and then load it onto your

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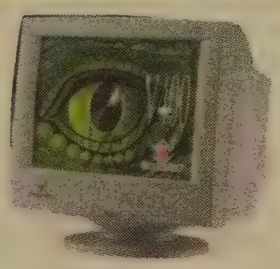
.25mm Dot Pitch
1600X1200Max
1280X1024@75Hz

$255

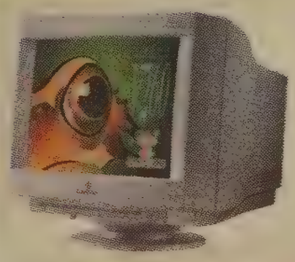
V400 19" Color Monitor



.26mm Dot Pitch
1600X1200Max
1024X768@115Hz

$464

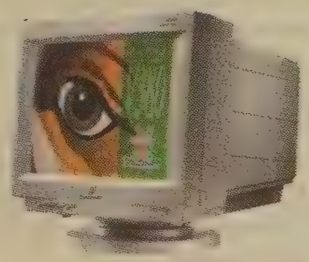
V260 15" Color Monitor



.28mm Dot Pitch
1280X1024Max
1024X768@85Hz

$126

V380 17" Color Monitor



.27mm Dot Pitch
1280X1024Max
1024X768@85Hz

$190

G380 17" Color Monitor

.25mm Dot Pitch
1280X1024Max
1024X768@85Hz

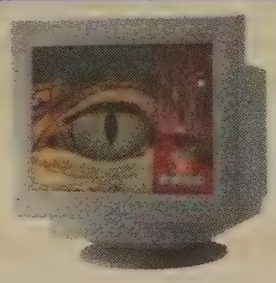
$242

G387 17" Color Monitor

.25mm Dot Pitch
1600X1200Max
1024X768@115Hz

$318

GA387 17" Color Monitor



.25mm AG
Stripe Pitch
1600X1200Max
1024X768@115Hz

$350

PA380 17" Color Monitor

.25mm AG
Stripe Pitch
1600X1200Max
1024X768@119Hz

$421

G400 19" Color Monitor

.25mm Dot Pitch
1600X1200Max
1024X768@115Hz

$480

PA630 21" Color Monitor

.28mm AG
Stripe Pitch
1800X1440Max
1024X768@129Hz

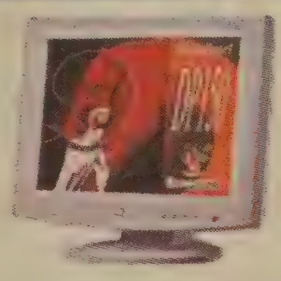
$1030

DP140 Color LCD

.27mm Pixel Pitch
1024X768Max
13.8 Viewable

$999

DP150 Color LCD



.29mm Pixel Pitch
1024X768Max
15.0 Viewable

$1159

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- Intel i740 8MB AGP Video Card
- Toshiba 32X CD-ROM Drive
- Diamond Supra 56K v.90 PCI VoiceFaxModem
- Teac 1.44MB Floppy Drive
- Creative Labs Ensoniq AudioPCI
- 17" (16.0"v) .27 DecaView V380 Monitor
- 320W Multimedia Speakers
- Mitsumi PS/2 Mouse

- Mitsumi PS/2 104 Keyboard
- Microsoft Windows 98
- Enlight ATX MidTower Case

$1199

AGP DREAM STATION

- DFI P2BXL BX Chipset Motherboard
- Intel Pentium II 350MHz
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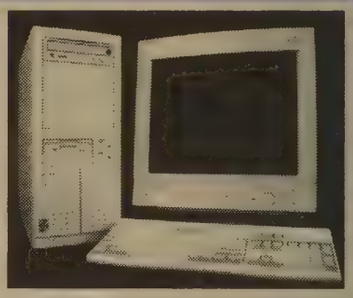
- 8.4GB Quantum Ultra-ATA HD
- Intel i740 8MB AGP Video Card
- Toshiba 32X CD-ROM Drive
- 3Com USR 56K v.90/x2 VoiceFaxModem
- Teac 1.44MB Floppy Drive
- Creative Labs Ensoniq AudioPCI
- 17" (16.0"v) .25 DecaView V385 Monitor w/USB
- ACS 45.1 Speakers w/Subwoofer
- Mitsumi PS/2 Mouse
- Mitsumi PS/2 104 Keyboard



- Microsoft Windows 98
- Enlight ATX MidTower Case

$1899

AGP PRO STATION UPGRADES

CPU
P2/266 (+$50)
P2/300 (+$150)
P2/333 (+$250)

MOTHERBOARDS
Abit LX6 (+$15)
ASUS P2L97 (+$30)

MEMORY
128MB (+$80)

HARD DRIVES
8.4GB Ultra-ATA (+$80)
11.5GB Ultra-ATA (+$130)

VIDEO CARDS/VOODOO 2
ATI All in Wonder Pro AGP 8MB (+$170)
Matrox Mystique G200 8MB (+$Call)
Diamond /Creative Voodoo 2 8MB (+$205)
Canopus Pure 3D II Voodoo 2 12MB (+$299)

CD-RECORDERS/REWRITERS
HP Surestore 7200I CDRW 6x2x2 IDE (+$379)
Mitsumi CDR 2x8 IDE (+$250)

BACKUP DRIVES
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LS-120 120MB Floppy (+$80)

SPEAKERS
ACS45.1/PC Works (+$50)
ACS48/Sound Works (+$100)
ACS500/Micro Works (+$200)

SOUND CARDS
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Diamond Monster Sound PCI (+$50)
Sound Blaster AWE 64 (+$45)
Sound Blaster AWE 64PCI (+$50)
Sound Blaster AWE 64Gold (+$100)

MONITORS
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DecaView G380-2 Monitor (+$52)
17" (16.0"v) .25
DecaView V385 Monitor w/USB (+$65)

MOUSE/KEYBOARD/JOYSTICK
Logitech Mouseman (+$15)
Microsoft Intellimouse (+$20)
Microsoft Natural Keyboard Elite (+$35)
Microsoft Sidewinder Pro (+$55)

SOFTWARE
Corel Office 7 Professional (+$50)
Microsoft Windows 95/NT (+$0)
Microsoft Home Essentials (+$95)
Microsoft Office 97 Pro (+$150)
Microsoft Office 97 SBE (+$150)

CASES
ASUS/ELAN VITAL T10 Mid Tower (+$20)
In-Win A500 Mid Tower (+$0)
In-Win 300W Full Tower (+$50)
Addtronics Extra Super Mid Tower (+$40)
Addtronics/SuperMicro Full Tower 300W (+$145)

AGP DREAM STATION UPGRADES

CPU
P2/300 (-$150)
P2/400 (+$200)

MOTHERBOARDS
Abit BX6 (+$20)
ASUS P2B98 (+$35)
ASUS P2B98-L (+$45)

MEMORY
256MB (+$155)

HARD DRIVES
10GB Ultra-ATA (+$50)
11.5GB Ultra-ATA (+$75)

VIDEO CARDS/VOODOO 2
ATI All in Wonder Pro AGP 8MB (+$170)
Matrox Mystique G200 8MB (+$Call)
Diamond /Creative Voodoo 2 8MB (+$205)
Canopus Pure 3D II Voodoo 2 12MB (+$299)

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Mitsumi CDR 2x8 IDE (+$250)

BACKUP DRIVES
100MB Zip ($+80)
LS-120 120MB Floppy (+$80)

SPEAKERS
ACS48/Sound Works (+$50)
ACS500/Micro Works (+$150)

SOUND CARDS
Diamond Sonic Impact PCI (+$20)
Diamond Monster Sound PCI (+$50)
Sound Blaster AWE 64 (+$45)
Sound Blaster AWE 64PCI (+$50)
Sound Blaster AWE 64Gold (+$100)

MONITORS
17" (16.0"v) .26 DecaView V387 Monitor (+$55)
19" (18.0"v) .26 DecaView V400 Monitor (+$209)

MOUSE/KEYBOARD/JOYSTICK
Logitech Mouseman (+$15)
Microsoft Intellimouse (+$20)
Microsoft Natural Keyboard Elite (+$35)
Microsoft Sidewinder Pro (+$55)

SOFTWARE
Corel Office 7 Professional (+$50)
Microsoft Windows 95/NT (+$0)
Microsoft Home Essentials (+$95)
Microsoft Office 97 Pro (+$150)
Microsoft Office 97 SBE (+$150)

CASES
ASUS/ELAN VITAL T10 Mid Tower (+$20)
In-Win A500 Mid Tower (+$0)
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Addtronics Extra Super Mid Tower (+$40)
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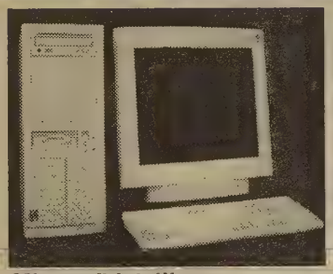
- 128MB SDRAM w/EEPROM
- 4.5GB Quantum Ultra 2 Wide SCSI HD
- Diamond Stealth II G460 8MB AGP Video Card
- Toshiba 32X SCSI CD-ROM Drive
- 3Com USR 56K v.90/x2 VoiceFaxModem
- Teac 1.44MB Floppy Drive
- Creative Labs Ensoniq AudioPCI
- 19" (18.0"v) .26 DecaView V400 Monitor
- ACS 45.1 Speakers w/Subwoofer



- Microsoft Intellimouse
- Multimedia PS/2 104 Keyboard w/Hot Keys
- Microsoft Windows 98
- Enlight ATX MidTower Case

$2599

AGP EXPERT STATION UPGRADES

CPU
P2/450 (+$call)

MOTHERBOARDS
ASUS P2B98-S (+$25)
ASUS P2B98-LS (+$70)
ASUS P2B98-DS (+$135)

MEMORY
256MB (+$155)

HARD DRIVES
9.1GB Ultra 2 Wide (+$250)
18.2GB Ultra-ATA (+$900)

VIDEO CARDS/VOODOO 2
ATI All in Wonder Pro AGP 8MB (+$150)
Matrox Mystique G200 8MB (+$Call)
Diamond /Creative Voodoo 2 8MB (+$205)
Canopus Pure 3D II Voodoo 2 12MB (+$299)

CD-RECORDERS/REWRITERS
Plextor CDR 4x12 (+$445)
Teac CDR-55S 4x12 (+$375)
Ricoh CDRW 6x2x2 (+$435)
Yamaha CDRW 6x4x2 (+$465)

BACKUP DRIVES
100MB Zip ($+80)
LS-120 120MB Floppy (+$80)

SPEAKERS
ACS48/Sound Works (+$50)
ACS500/Micro Works (+$150)

SOUND CARDS
Diamond Sonic Impact PCI (+$20)
Diamond Monster Sound PCI (+$50)
Sound Blaster AWE 64 (+$45)
Sound Blaster AWE 64PCI (+$50)
Sound Blaster AWE 64Gold (+$100)

MONITORS
17" (16.0"v) .25
DecaView PA380 Monitor (-$43)
19" (18.0"v) .26
Cornerstone 45/101sf Monitor (+$300)
21" (20.0"v) .28
DecaView PA630 Monitor (+$566)

MOUSE/KEYBOARD/JOYSTICK
Logitech Mouseman (-$5)
Microsoft Natural Keyboard Elite (+$25)
Microsoft Sidewinder Pro (+$55)

SOFTWARE
Corel Office 7 Professional (+$50)
Microsoft Windows 95/NT (+$0)
Microsoft Home Essentials (+$95)
Microsoft Office 97 Pro (+$150)
Microsoft Office 97 SBE (+$150)

CASES
ASUS/ELAN VITAL T10 Mid Tower (+$20)
In-Win A500 Mid Tower (+$0)
In-Win 300W Full Tower (+$50)
Addtronics Extra Super Mid Tower (+$40)
Addtronics/SuperMicro Full Tower 300W (+$145)

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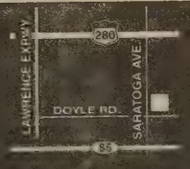

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continued from page 78

Palm III. (While some think this might be a good thing to do regularly, it substantially increases the time it take to hotsync, so I don't recommend it.

Next month, look for a hands-on review of the Novatel Wireless Minstrel, the wireless Internet connection for the Pilot. ◆

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Installation of the upgrade card is reputedly simple, requiring no tools. You just replace the original memory cover and card with new ones.

MONTHLY SPECIALS
(while supplies last)

120 Watt Speakers $6
104 Mitsumi Keyboard $7
Floppy 1.44 . . . . . $15
Pentium 256K m/b & Intel P-133 CPU . . $95
486 m/b w/12mb Memory & DX2/66 CPU . . $60
Pentium m/b w/512K cache up to 166MHz. . $35

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Pentium® II 440 Ultra DMA 1 AGP Slot $85
TX Pro II Chipset w/512K/up to 233MHz w/ sound & Video . .$60
TX Pro w/512K Socket 7 On Board Sound/4MB AGP Video Card . .$85
PI ABIT TX Chipset/Jumperless/512K w/Sound. $75
PI TX Chipset/512K/up to 300MHz $55

BASIC SYSTEM
- Mini Tower Case
- TX Pro II Chipset Motherboard w/512K cache
- IBM 200
- 586 Cooling Fan
- 16MB EDO Ram
- Video On Board
- 2.1 Gigabyte HDD
- 1.44 Sony FDD
- 16 Bit Sound On Board
- 8X CD-ROM
- 33.6 Fax/Modem w/voice
- 3 button mouse
- 104-key Win 95 Compatible Keyboard
- 60 watt speakers

$403

HOME SYSTEM
- Mini Tower Case
- TX Pro II Chipset Motherboard w/512K cache
- 586 Cooling Fan
- 16MB EDO Ram
- Video On Board
- 2.1 Gigabyte HDD
- 1.44 Sony FDD
- 16 Bit Sound On Board
- 12X CD-ROM
- 33.6 Fax/Modem w/voice
- 3 button mouse
- 104-key Win 95 Compatible Keyboard
- 60 watt speakers

With the following CPU's...
Intel Pentium MMX 233/200.....$476/448
Cyrix MX 266/233.....$447/409
AMD K6 MX 233.....$418

OFFICE SYSTEM
- Mini Tower Case
- TX Pro II Chipset Motherboard w/512K cache
- 586 Cooling Fan
- 32MB EDO Ram
- Video On Board
- 4.3 Gigabyte HDD
- 1.44 Sony FDD
- 16 Bit Sound On Board
- 24X CD-ROM
- 56.6 Fax/Modem w/voice
- 3 button mouse
- 104-key Win 95 Compatible Keyboard
- 60 watt speakers

With the following CPU's...
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Cyrix MX 266/233.....$576/479
AMD K6 MX 233.....$487

PENTIUM II SYSTEM
- Super Mini Tower
- Pentium II 440 LX
- Pentium II - 266MHz
- Pentium II Cooling Fan
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- 3D 4MB A.G.P. Video
- 4.3 GB HDD
- 1.44 FDD
- 16BIT 3D Sound
- 24X CD-ROM
- 56.6K Fax Modem
- 3-Button Mouse
- 104 Key Win 95 Compatible Keyboard
- 60 Watt Speaker

$720

HARD DRIVE
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3.2GB HD. $130
4.3GB HD $135
6.4GB HD. $180
8.4GB HD. $275

MEMORY
SIMM 72 Pin 16MB. . $16
SIMM 72 Pin 32MB. . $30
SIMM 72 Pin 64MB. . $70

SDRAM 16MB $16
SDRAM 32MB $35
SDRAM 64MB EDO . $78
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PCI 1MB 64-Bit S3 Virge $18
PCI 2MB S3 . . . . . $28
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Diamond 1MB $39
Diamond 2MB $45
Diamond 4MB $60
Monster 4MB PCI . $153
VLB 1MB Cirrus Logic $17

SOUND CARD
16-Bit Opti $12
16-Bit Yamaha $12
16-Bit Jazz $12

MONITOR
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17" 0.28 Monitor . . $250
17" 0.25 Monitor Sony $560
17" 0.26 ViewSonic . $515

Mini Tower $19
Jumperless LED Setup

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24X $44
24X Sony. $56
32X $52
36X $58

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PCI Network Card. . . . $18
Video Camera. $135
Floppy Drive. $16
Mouse $5
80W Speakers $11
160W Speakers $19
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Pent. II 440LX
M/B w/A.G.P. 4MB 3D Video & SIS Sound Pro
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Pilot Accessories

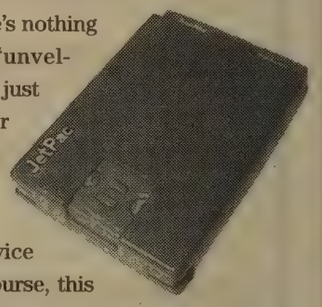
Stylin' Stylus

For the ultimate in a handheld/PDA stylus replacement, look no further than the Cross Digitalwriter Duo ($35). The product combines a Cross ballpoint ink pen on one end with a stylus on the other. It also features Cross's patented "pen-on-paper" feel, which really brings a more natural feel to on-screen writing.

The pen side is normally covered by a screw-off cap, which sits noticeably loose when placed over the stylus end. This helps to prevent you from leaving it there and accidentally writing on your display with the pen end. How ingenious! The Duo is available in blue, black and burgundy colors.

Protective Gear

I've been waiting for a truly efficient belt carrying case for the Pilot, and J. P. Solutions may have hit the mark with JetPac ($20). Any model Pilot will slip into this lightweight one-piece product, including the new Palm III (sans flip cover).



What I really like about this product is that there's nothing to flip up, unzip, "unvelcro," etc. Your Pilot just slides out, ready for immediate use. Plus, the rigid plastic construction keeps your device perfectly safe. Of course, this accessibility comes at the risk that with significant jarring, your Pilot could pop out.

Hands High Pilot Software

Hands High Software's Memo PLUS ($15) and ToDo PLUS ($15) are direct replacements for the Pilot Memo Pad and To Do. Both even use the same respective database files—a very nice touch.

What sets them apart from the built-in apps is that you can attach drawings to entries. The drawing tools are about as basic as you can get, but get the job done. A great feature is the ability to re-order categories.

Memos can also be sorted forward or reverse alphabetically. You can even attach an alarm and password notes. Memo PLUS also features note and drawing "models," that are essentially

continued on page 170

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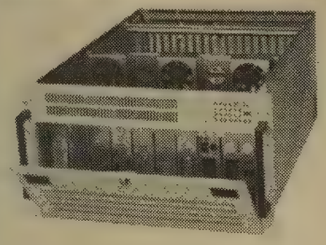
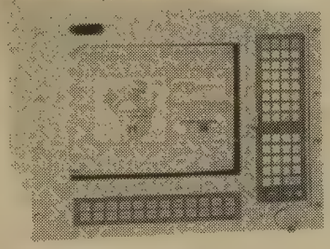


- 6U Rackmount Chassis
- 20-Slot ISA/PCI BP Option: 10+10, 5+5+5+5
- Redundant Power Supply
- 8 Drive Bays



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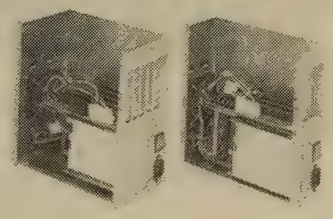
- Built-in 14" or 15" Color SVGA Monitor (or 9.4/10.4/14" Color LCD)
- PS Universal 65-265 VAC Input or DC/+12,+24, -48V Input
- 4/8/10/12/14 Slot ISA/PCI Backplane Option

- 2U Height (3.5") Chassis
- 4 Drive Bays, 1-CD, 1-FD, 2-HD
- PS AC Universal, or DC/+12, +24, -48V
- 5-Slots
  Type 1: 2-PCI, 2-ISA, 1-CPU (PICMG)
  Type 2: 5-ISA
  Type 3: 4-PCI, 1-CPU (PICMG)



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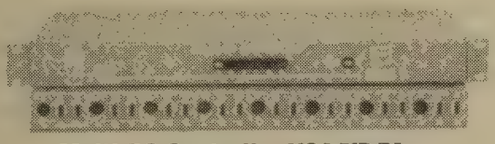

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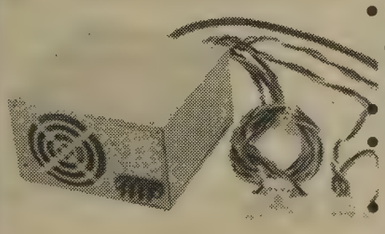

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- 70W-350W Output
- 0-55 Degree Celsius Operating
- MTBF>20 Years

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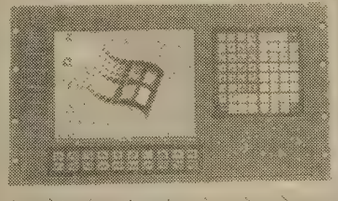

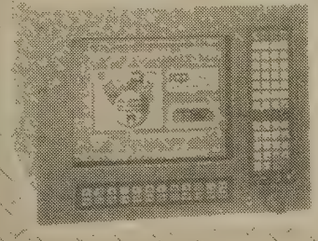

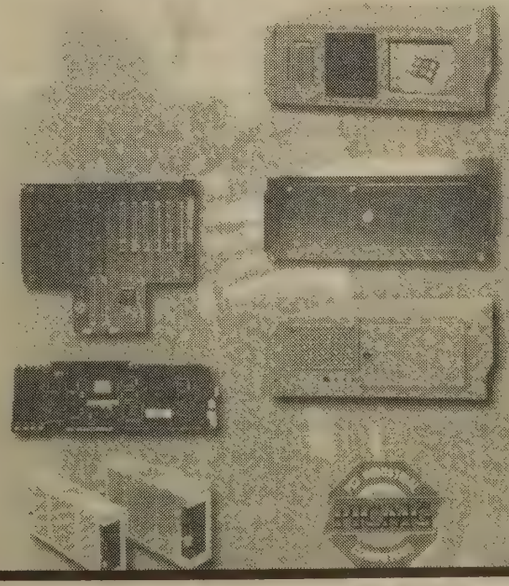

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"Hello, World" Java-Style

Applets, Servlets, And Old-Fashioned Programs (Part 1 of 2)

By Bennett Falk

Unlike old-fashioned programs, Applets are run in a browser and not from a command line.

Java is much discussed these days because it is the language that makes applets possible. Applets are little programs, embedded in Web pages, that can be downloaded with the page and executed on the computer of the unsuspecting Internet user.

Since Java's introduction in 1995, Web developers have become enchanted with applets, so much so that applet programming sometimes overshadows the other things that can be done with Java.

Java, it turns out, is not just an applet programming language. It can also be used to create both old-fashioned, stand–alone programs (that need not have anything to do with either the Web or client/server application architecture) and servlets (the less-well understood server-side cousins of applets).

In the interest of better Web applications and more informed cocktail chatter, there follow three and a half adaptations of the obligatory "Hello, World" program to illustrate the use of Java in applets, servlets, and old-fashioned programs. This month's column explains how to code Java programs and applets; next month's addresses the issue of creating servlets.

To work through these exercises, first download the Java Developer's Kit from JavaSoft (or use your favorite visual development environment). To work with the servlet example, you'll also need the Java Servlet Developer's Kit (JSDK) also available from JavaSoft.

Hello 1

The code below is an old-fashioned program written in Java:

```
// Hello 1
class Hello {
   public static void main (String argv[]) {
         System.out.println("Hello, World!");
   }
}
```

The basic thing that happens in any Java program is the definition of a class. In this example, the class's name is "Hello" (Java class names are case-sensitive).

The Hello class has one method, whose name is "main". "main()" is a special method that will be executed automatically when the Java interpreter is invoked on the Hello class. "main()" is what makes this class a stand-alone program. The "main()" method needs to be declared as shown.

The main() method invokes System.out.println with a single argument (the string "Hello, World!"). System.out.println will print this argument on the standard output.

To compile the Hello class, put the code above in a file named "Hello.java", open a command line interface (a DOS window or a UNIX shell), set the CLASSPATH environment variable to point to the classes bundled with the JDK and feed this file to the Java compiler:

```
javac Hello.java
```

This command will turn the Java source code into byte codes that the Java Virtual Machine can work with. The byte codes will be stored in a file named "Hello.class". Note that the file name and the declared class name in the file must agree: the source code file for the Hello class must be named "Hello.java". A compiler error results if the file name and class name do not agree.

To execute the Hello class, invoke it by name on a Java command line (again from a DOS window or UNIX shell prompt). Executing the old-fashioned program should look something like this:

```
C:> java Hello
Hello, World!
```

The Java interpreter looked at Hello.class, found a main() method and executed it.

This version of Hello is about as simple as it can get. It's also not good for use as anything but a standalone program. With just a little bit of redesign, Hello can be made much more versatile.

Hello 1.5

The code below is a standalone program that does the same thing as Hello 1, but it divvies up the work somewhat differently.

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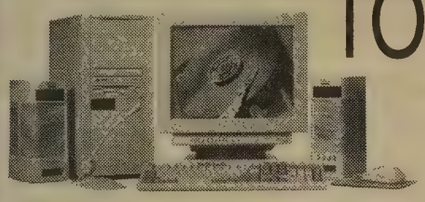

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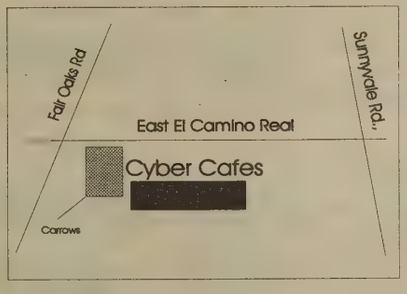

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```
// Hello 1.5:
class Hello {
   public static void main (String argv[]) {
         System.out.println(hello());
   }
   public static String hello() {
         return("Hello, World!");
   }
}
```

Hello 1.5 has two methods: "main()" and "hello()". "main()" executes "System.out.println" on whatever the "hello()" method returns. The important thing to note is that method invocations can be nested.

The "hello()" method is declared to return data of type "String", and in the body of the method, the data passed to the "return()" statement must agree with this declared return type.

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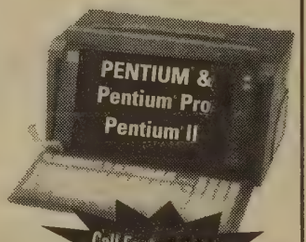

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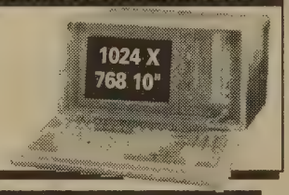

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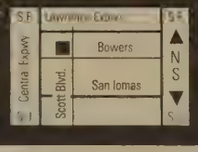

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Hello 1.5 is compiled and run using the same commands as Hello 1: put the code above in a file named "Hello.java" and use javac to compile the class.

Hello 1.5 will be used again in the servlet example below.

Hello 2

The second hello is an applet named "AppletHello". The source code for AppletHello looks like this:

```
// Hello 2: AppletHello
import java.applet.Applet;
import java.awt.Graphics;
public class AppletHello extends Applet {
   public void paint(Graphics g) {
     g.drawString("Hello, World!", 50,50);
   }
}
```

The first thing to note is that "AppletHello" has some dependencies outside the core Java system. Two classes defined elsewhere in the JDK are imported to AppletHello: "java.applet.Applet" defines the basic characteristics of applets and "java.awt.Graphics" defines a graphical object that supports a few basic Graphical User Interface operations.

Java, it turns out, is not just an applet programming language. It can also be used to create both old-fashioned, stand-alone programs and servlets.

In the class declaration that follows the two import statements, "AppletHello" is defined as an extension of the Applet class. This means that "AppletHello" inherits all the features defined in the Applet class. It is this relationship to the Applet class that makes "AppletHello" an applet.

Like Hello 1, the "AppletHello" class has one method. Its name is "paint". The "paint()" method assumes the existence of a graphics object: in this case, the object will be supplied by the context in which the "AppletHello" is run. Notice that there is no "main()" method.

The "drawString()" method is part of the definition of the Graphics object. "drawString()" takes three arguments: a string constant and two coordinates that define the location in the

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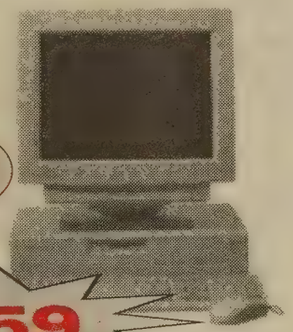

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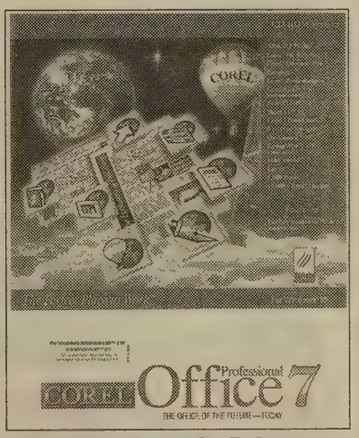

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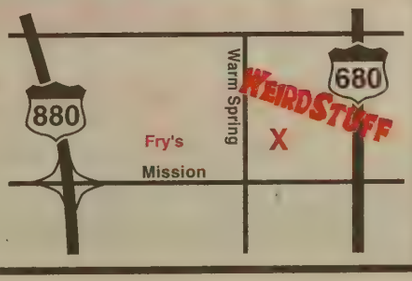

display area where the string constant is to be displayed.

The compilation procedure for applets is the same as that for standalone programs. The source code for "AppletHello" must be in a file named "AppletHello.java". The compiler command is:

javac AppletHello.java

The compilation produces "AppletHello.class".

Unlike old-fashioned programs, Applets are run in a browser and not from a command line. To launch AppletHello, you'll need a Java-enabled browser (Netscape, Internet Explorer, or HotJava) and an HTML page that tells the browser's Java environment which applet to execute. The HTML page and applet can be loaded from the local file system, so a Web server is not necessary to test AppletHello.

An HTML page to launch "AppletHello" could be as simple as:

```
<html>
<title>"Hello, World" Applet</title>
<body>
<applet code="AppletHello.class" width=200
height=80>
</applet>
</body>
</html>
```

The applet tag in this page identifies the applet to be run and the display area it is allowed to use.

With the HTML page in the same directory as the "AppletHello.class" file, start your browser and use "Open Page" on the browser's File menu to load the HTML page and launch "AppletHello". (The dread "Starting Java..." message will appear in the status line of the browser.) Using the Graphic object provided by the browser, the message "Hello, World!" will be drawn in the display area of the browser window.

Next month: "Hello, World!" servlets. ◆

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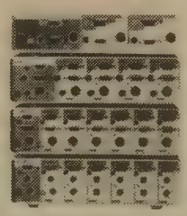

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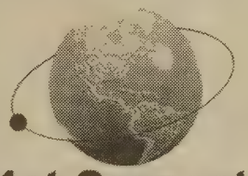

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Graphics	4MB 3D ATI Rage II
CD/Tape Drive	32xCD SCSI Toshiba
I/O Ports	Ultra/Wide SCSI dual channel (internal/external), 100Base-T Ethernet, 1xRS-423 serial, 1xParallel Centronics compatible
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Mouse	Microsoft 2.0 PS/2
Enclosure	Mid-tower chassis with 300W power supply, 2 fans

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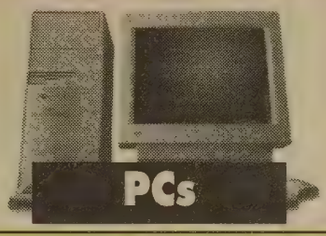

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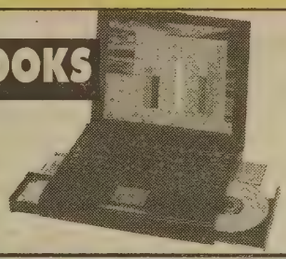

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Asus SP97V/512k+Pentium 233MMX	$190
Asus SP97V/512k+Pentium 200MMX	$183
Asus SP97V/512k+AMD K6-233 Mhz	$150
Asus TX97/512K + Pentium 233MMX	$220
Asus TX97/512K + Pentium 200MMX	$216
Asus TX97/512k + AMD K6 300MMX	$245
Asus TX97/512k + AMD K6 266MMX	$208
Asus TX97/512k + AMD K6 233MMX	$182

VIDEO CARDS

❖TRIDENT

1MB ISA/1MB PCI	35/25

❖DIAMOND

Stealth 3-D PRO 2mb/4mb	54/62
Stealth II 4MB PCI SGRAM	78
Stealth II G460 8MB AGP	89
Monster II w/8mb/12mb	190/238
3D 4000 4MB AGP	57
FireGL1000ProAGPw/4m/8	140/170
Viper 330 AGP 4mb	90

❖MATROX

Prod. G100 AGP 4MB/8MB	65/77
Millenium G200 AGP 8MB	125
Millenium II PCI 4MB/8MB	112/168
Millenium II AGP 4M	117
Mystique 220 4MB oem	65

❖NUMBER NINE

Revol. 3D 4mb/8mb WR AG	110/162

❖ATI

All-In-WonderProAGP 4MB/8MB	217/240
XPERT 98 AGP 8MB	89
XPERT@PLAY AGP 4MB/8MB	102/120
XPERT@WORK AGP 4MB/8MB	80/110

MONITORS

❖NANAO

EIZO FX-B5/TX-C7	406/745
TX-D7S(17")	1463
EIZO FX-C5/FX-C6	620/698
FX-E7 / FX-E8	1463/1945

❖NEC

P750(17".25dp)/M700	730/556
E500/E700/M500	265/511/354
E1100(21")/A700(17")	1035/406

❖MAG

DJ800(19") / DX715T	534/432
DX500T / DJ700	213/335
DJ530 / DX700T (.25DP)	178/357
DJ920(21") / DJ702E	823/286
Princeton EO 50 / EO70	200/298
Princeton EO 90 (19" .26)	610

❖SONY

100ES/100GS/220VS	274/329/741
200GS/200ES/200PS	585/474/735
20SE2T/W900 (24")	1133/3220
400PS(19")/500PS (21")	920/1285

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CM500/CM620	225/410
CM800 (21")/CM-630	1008/435
CM-751 / CM802	774/1200

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G773 / P775	432/463
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G790/GT775/PS790	607/544/685

❖NOKIA

447ZA (17")/447XI	462/540
445XI (21") /446P(19")	1287/744

❖IIYAMA

9017E(17")/8617E(17")	494/459
901GT(19")/A102GT(21")	660/973

❖MGC

NI 14" Monitor 0.28	117
NI 15" .28 Digital Control	145
NI 17" Monitor 0.27	266
NI 1785 1600X1200 0.26	340

BACKUPS

T-3000 3.2GB/T4000 8GB	165/340
Iomega Zip 100 IDE Int /SCSI	90/100
Iomega Zip 100 Parrallel	139
Iomega Jaz 1.0GB SCSI Int.	250
Iomega Jaz 1.0GB SCSI Ext	265
HP DAT 4-8GB oem	660

❖TEAC

Floppy Drive 1.44	20

HARD DRIVES

❖FUJITSU

4.3 GB EIDE(M3043AT/UD)	153
5.2 GB EIDE(M3052AT/UD)	182
6.4 GB EIDE(M3264AT/UD)	193

❖QUANTUM

3.2 GB EIDE(ST33200SE-A)	144
4.3 GB EIDE(ST34300SE-A)	158
6.4 GB EIDE(ST36400SE-A)	204
8.4 GB EIDE(ST38400SE-A)	265
2.1 GB UL SCSI(ST32100SE)	203
4.3 GB UL SCSI(ST34300SE)	267
6.4 GB UL SCSI(ST6400SE-S)	345
8.4 GB UL SCSI(ST8400SE-S)	445

❖WESTERN DIGITAL

2.1 GB EIDE(AC22100)	133
3.2 GB EIDE(AC23200)	145
4.3 GB EIDE(AC34300)	153
6.4 GB EIDE(AC36400)	192
4.3GB UW SCSI (E4360-007)	410
9.1GB UW SCSI (WDE9100W)	655

❖SEAGATE

2.5GB UDMA (ST32520A)	138
4.5GB UW SCSI (ST34501W)	540
9.0GB UW SCSI (ST19101W)	765

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4.3 GB ULTRA DMA	144
6.4 GB ULTRA DMA	183
8.4GB ULTRA DMA	238
11.5GB ULTRA DMA	298

❖IBM

4.3GB UW SCSI (AS34560W)	315
9.1GB UW SCSI (AS39130W)	580

CONTROLLERS

❖ADAPTEC

Adap. PCI 2940AU OEM w/SW	140
Adap. PCI 2940UWw/SWOEM	175

CASES

Baby AT Case w/ 230W	38
Mini Tower case w/230W	29
Medium Tower case 230W	45
ATX Desktop case	65
ATX Medium case	62
ATX Full Tower case w/300W	105

SOFTWARE

MS Win NT 4.0 WS w/sys	130
MS Win NT 4.0 Server w/sys	445
Office Pro 97 no manual w/sys	160
Office Pro 97 w/manual w/sys	215

MICE

MS PS2 Mouse w/system	23
MS IntelliMouse w/system	25
Logitech Mouseman/Trackman	22/39
Logitech Marble Trackman	49

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*Microsoft mouse w/ pad
*32X EIDE Internal CDROM
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* KeyTronic 104 Enhanced KB
* Logitech PS/2 Mouse w/ Pad
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* 2 Serials (16550 UART) & Parallel Port
* ATX Med Tower Case w/ 230 Watts
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* Shield computer power speaker
* 33.6 Internal Fax Modem
* Microsoft Windows 98 (New Arrival)

Option:
*MS Office 97 Small Business Edition $209

$ 959 / 999
200MMX / 233MMX

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* Mitsumi Mouse w/ Pad
* Built in Board PCI EIDE Controller 4HD/2FD
* 2 Serials (16550 UART) & Parallel Port
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* 24X EIDE internal CDROM
* Shield computer power speaker
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*32X EIDE Internal CDROM
*Creative Lab AWE 64 Sound Card
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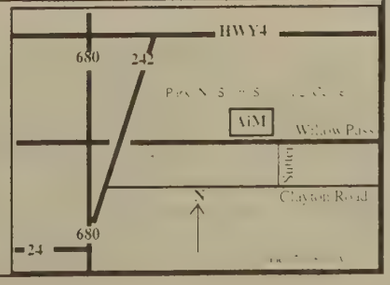

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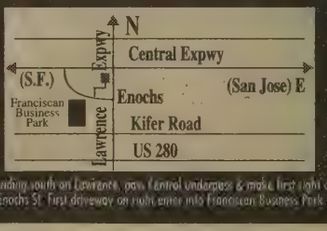

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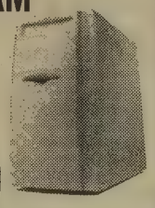

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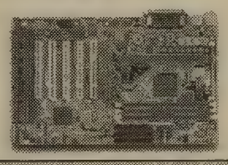

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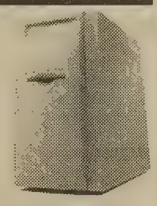

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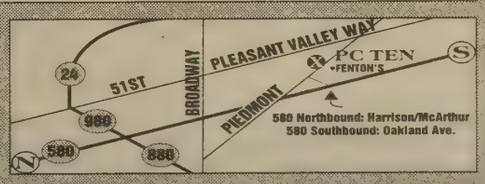

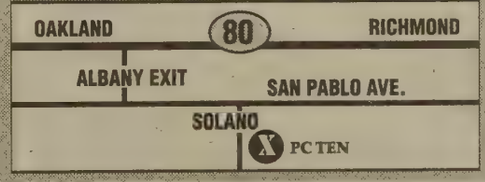

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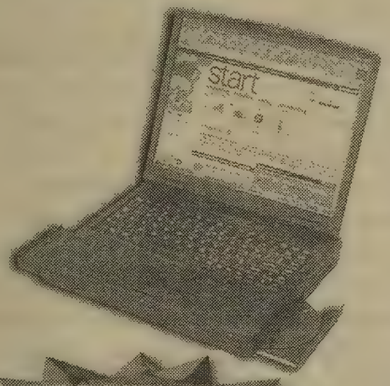

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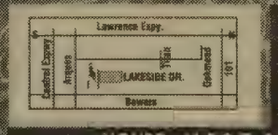

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Processor Subsystem Performance

Chipsets, System Boards, And CPUs

By Fabian Pascal

Since performance differences between boards are negligible, reliability, compatibility, features, and support become more critical issues.

You may want to review three of my previous articles (issues 171, 174, 177 at www.microtimes.com *as background for the following. A more detailed description of the testing tools, with links to their home pages, is posted on this series' page* (www.microtimes.com/32bitres.html)*, together with other useful information.*

As we've already explained, the system board (with the chipset around which it is built) is an important component of all PC subsystems. The following chipsets currently support the 100MHz memory (front-side) bus (FSB):

- Slot 1: Intel 440BX
- Super7: VIA MVP3

Acer Labs (ALi) Aladdin V

One of the articles mentioned above provides general guidelines for choosing a system board. Because performance differences between boards have shrunk to about 1–2%, reliability, compatibility, features, and support are becoming more important (see *http://sysdoc.pair.com* , *www.anandtech.com*). We'll mention some useful features specific to Slot 1 and Super7 boards as we go along.

Several manufacturers have started shipping Super7 boards. Reliability, compatibility, size of L2 cache, ease of configuration, and overclockability are issues with Super7 boards and a function of both the chipset and the board implementation. K6-2 (formerly known as K6-3D) is the first CPU supporting the Super7 100MHz FSB. There are 266 and 300MHz versions, with 333 and 350 forthcoming.

I have chosen to test the Abit BX6 Slot 1 mainboard. It is reliable and offers all the features other boards do, but also some unique ones. Its SoftMenu BIOS feature allows not only for a wide range of jumperless preset combinations of CPU (233–400MHz) and bus (66–100MHz) speeds, but also user defined combinations at bus speeds of 103, 112 and 133MHz. This, together with the user-adjustable CPU voltage in .05V increments are important for overclocking (see below).

The Slot 1 CPUs supporting 100MHz FSB are the PII400 and PII350 (Deschutes). Since Intel does not provide review units, I borrowed a PII350 from Abit to compare the Deschutes with the PII300 (Klamath), which supports the 66MHz FSB.

Memory

The 100MHz FSB requires 8ns SDRAM compliant with the PC100 specifications. 10ns SDRAM is unlikely to work; even if it does, reliability is questionable. According to ATP's Don Dilley: "Memory can exceed specs, and such memory is sampled out in small quantity by the big foundries for future engineering development work. I doubt that most memory vendors can even buy such a sample, let alone an end-user. Only in this sense can non-PC100 memory work well at higher bus rates [and even if it does] there is little or no noise margin left, so you are likely running on the edge of disaster. I doubt if 66MHz SDRAM can run a 24 hour RAMExam memory diagnostic at 100MHz."

Reliability and compatibility depend on PC100 adherence and quality assurance by manufacturers. This varies across chip brands (and even across modules of the same brand) and so does price. Dilley advises: "[There are] bargains occasionally, but in general you get what you pay for in memory chips—the inexpensive ones do not perform with anything like the noise margins of the more expensive ones. It has not been easy for even top-of-the-line manufacturers to meet the stringent new specs, so guess what the ne'er-do-wells are giving us? Just because some cheap chips on a module run an application or test doesn't necessarily mean they will run reliably for a year under the varying and demanding real life environments. With new technology, I recommend the more expensive brands."

Currently, there are two types of PC100 SDRAM: CAS2 and CAS3. CAS latency (previously known as wait-states) is the number of clock cycles from a read command to the time the data is available on an open page. Because it is faster by up to 4% than CAS3 (three cycles) and the price difference minor to none, I recommend CAS2 (two cycles). Some system components

continued on page 102

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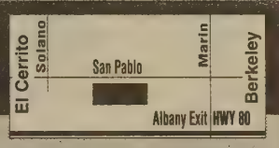

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- 4MB Matrox Millennium II SVGA Card
- Sound Blaster 64 PnP Sound Card
- 56K Fax Modem w/Voice
- 120-Watt Stereo Speakers
- Mid Tower Case w/230W PS
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- 104 Keytronic Enhanced Keyboard
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200MMX . . . $1290
233MMX . . . $1390

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- 4MB ATI Expert @ Play AGP SVGA Card
- Sound Blaster 64 PnP Sound Card
- US Robotics 56K Fax Modem w/Voice
- 120-Watt Stereo Speakers
- ATX Case w/230W PS
- Microsoft Mouse
- 104 Keytronic Enhanced Keyboard
- Windows NT 4.0 Workstation

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300MHz . . . $1790
333MHz . . . $1990

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- 1.44MB Mitsumi Floppy Drive
- 6.4GB Quantum Ultra DMA Hard Drive
- 32X CD-ROM
- Millennium w/8MB AGP SVGA Card
- Sound Blaster 64 PnP Sound Card
- 56K Fax Modem w/Voice
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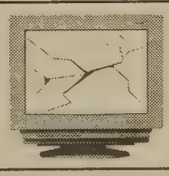

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- Intel 440LX Chipset
- Heat Sink & CPU Fan
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- Enhanced IDE w/16550 I/O
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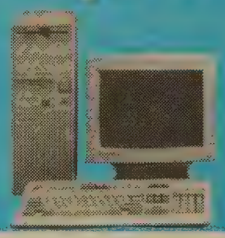

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- 104 Enhanced Keyboard

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Matrox Millennium II 4MB	135
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Adaptec 1522	90
Adaptec 2940 PCI SCSI	170
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4.0GB SCSHI	310

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586-166MHz w/Intel CPU & Fan	190

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Sound Blaster 16	45
Sound Blaster AWE 64	75

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Keytronic 104 Key	25
Maxiswitch 101 Key	25

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Logi Trackman	50
Mouse	15
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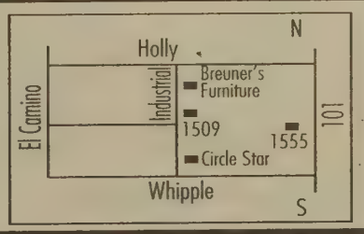

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continued from page 98

may not run reliably at the CAS2 BIOS setting (even if the system boots), but I have not seen such problems with the configuration in Listing 1.

Your safest bet is PC100 SDRAM officially supported by, or tested with your system board. In particular, beware of fake PC100 claims. CAS2 DIMMs from APT Electronics (Toshiba chips) and Kingston Technology work with

Listing 1: Recommended System

SYSTEM BOARD

BX6, $148–$172
Abit Computer
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www.abit-usa.com

PROCESSOR SUBSYSTEM

PentiumII/300MHz Processor, $309–$423
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www.intel.com

128MB PC100 CAS2 SDRAM

ATP Electronics
(408)732-5000
www.atpusa.com
Kingston Technology, $585 (MSRP)
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www.kingston.com
Unigen Corp.
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www.unigen.com

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FlexScan FX-E8 21" monitor, $1929–$1950
Eizo-Nanao Technologies
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www.eizo.com

Xpert@Work AGP Graphics Adapter 8MB, $91–$105
ATI Technologies Inc.
(905)882-2600
www.atitech.com

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AHA2940UW UltraWide Controller, $175–$239
Adaptec Inc.
(408)945-8600
www.adaptec.com

UltraStar 9ZX UltraWide 9GB disk drive, $1250–$1318
IBM Storage Systems Division
1-800-IBM-7777
www.ibm.com/storage

VikingII 9GB UltraWide disk drive, $708–$990
Quantum Corp.
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www.quantum.com

SyJet 1.5GB Removable disk drive, $245–$300
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DX-100 Kit Option, $29 (MSRP)
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System configuration in Listing 1:
WindowsNT Workstation 4.0, Service Pack 3, default caching; Graphics mode: 1600x1200x85 65K colors

continued on page 106

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Intel SE440BXPA	$188
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Intel AL440LX	$143
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- HOT 555A Main Board w/Intel 166MMX $179
- HOT 569 Main Board w/200/233MMX CPU $199/219
- HOT 637 PII Main Board w/233/266 PII CPU $295/329
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Monitor Not Included

Intel® P5 MMX
200/233.....$539/579
AMD K6-233.....$519

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- 56K Internal Fax/Modem w/Voice
- **Diamond Stealth 64 3D w/4MB VGA Card**
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the BX6 board, so I have included both brands as options. But as Dilley indicates, reliability must be assessed after considerable, varied use. RAMExam (*www.qualitas.com*) is a memory testing utility which can detect problems before they affect applications.

Performance

To isolate the effect of just the faster bus, everything except the bus speed must be held constant, which means running the PII300 at 100MHz, beyond its specification, or overclocking it. BX6's SoftMenu provides a convenient 300(100) setting for this (with other boards tape, or nail varnish may have to be applied to a CPU connector). Since the Unigen 10ns SDRAM I used with the LX board would not work at 100MHz, I used 128MB PC100 CAS2 SDRAM modules at both bus speeds (at 66MHz it runs as fast as 10ns SDRAM).

I tested performance with the PII300 at 66MHz and 100MHz, then with the PII350 at 100MHz for the combined effect of the faster bus and CPU. I ran three sets of benchmarks:

- MemBench measures L1 cache, L2 cache, and memory bandwidth
- Ziff-Davis Winstone 98 measures system level application performance
- Byte's BYTEMark and Ziff-Davis' CPUMark32 measure the performance of the CPU per se, in isolation (the latter is also affected by the system board and memory, which must be kept constant).

As Michael Krech notes: "Current processors run at very high rates internally, but are slower externally. Only what fits in the PII's 32KB internal (or L1) cache runs at the CPU's speed. Bigger programs/data must be read from the 512KB secondary (L2) cache, which operates at half the CPU rate; real big programs/data which cannot fit in L2 must be read from main memory (or even from disk, if they are swapped). That's why memory and L2 cache read/write/transfer rates (in short, bandwidth) are very important and why a 233MHz processor is less than 5% faster than the same one at 200 MHz in processor intensive applications!"

Krech developed the MemBench utility (*www.intelligentfirm.com*), which runs in DOS protected mode to measure the maximum bandwidth (in MB/sec) that a processor subsystem is capable of.

The MemBench results in Figure 1 demonstrate Krech's point: L1 cache operations—at CPU speed—can achieve more than 1GB/sec, L2 cache 200–500MB/sec (actually less than half the CPU speed) and main memory only 30–200MB/sec! To use the pipe metaphor, memory is the narrowest section of the subsystem.

The 66 to 100MHz increase is 50%. Figure 1 shows that the actual increases in memory bandwidth are 43% for reads, 44% for transfers (read + write), 35% for writes and only about 13–16% for random operations. Cache bandwidth is not affected (see concluding section).

But for the user the question is whether this translates into application gains. Winstone 98 results in Table 1 show that popular business applications gain only about 2% overall from the faster bus, with gains for individual applications ranging from about 1% for word-processing to less than 3% for

Table 1: CPU Performance

CPU	300	350
CPUmark32**	755	882
FPU WinMark**	1550	1800
Integer Index***	4.22	4.88
FP Index***	4.84	5.52

** Ziff-Davis Winbench 98™ v.1.0 *** BYTEmark™ v.2

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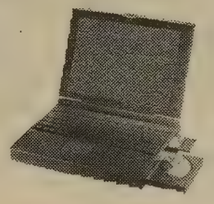

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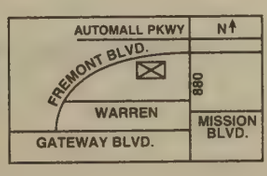

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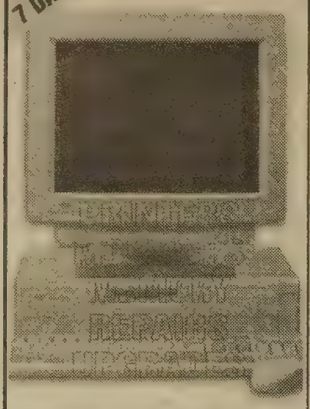

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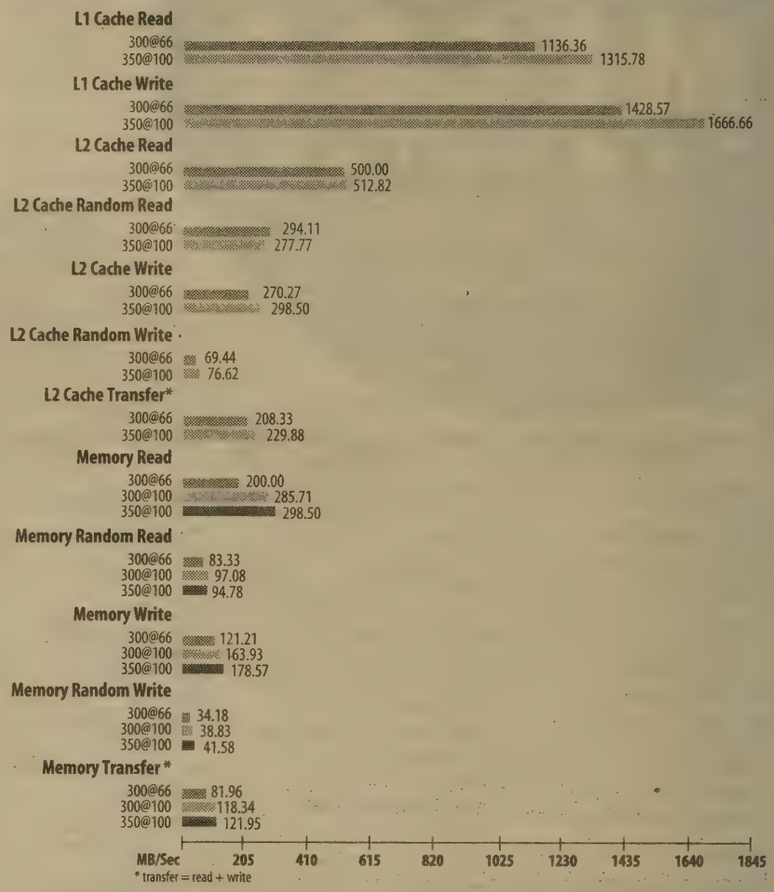
Fig. 1: MemBench Results—bus speed, CPU speed, and bandwidth



browsers. High-end applications (more graphics intensive) gain only slightly more—over 3% overall, with application gains from over 2% for Photoshop, to over 7% for AVS/Express.

Does a faster CPU that officially supports the 100MHz FSB help? The BYTEMark and CPUMark32 results in Table 1 show that the PII350 is faster than the PII300 by 14.1%–16.8%; Figure 1 shows that the L1 bandwidth of the PII350@100 configuration is higher than that of the PII300@66 one by 15.9%–16.7%—in line with the 16.7% clock rate difference between the two CPUs. For memory, the gains are from 13.7%–21.7% for random operations, up to 47%–49% for sequential operations, which sets the CPU effect to 4%–8% over the bus effect. But for the L2 cache the gain shrinks to about 11% for writes and transfers, 2.6% for reads and for random operations there is either no effect, or even a decrease!

Table 2: Application Performance—Winstone 98*

CPU@Bus	300@66	300@100	350@100
Browsers	3.80	3.91	4.24
WP	3.03	3.07	3.36
SS/Database	2.42	2.47	2.59
Publishing	3.29	3.38	3.69
Task Switching	2.67	2.72	2.84
Winstone 98	29.4	30.1	32.4
AVS/Express	2.53	2.71	3.04
FrontPage 97	2.31	2.37	2.52
MicroStation 95	2.40	2.46	2.74
Photoshop 4.0	3.54	3.62	4.06
Premiere 4.2	2.65	2.73	2.88
PV-WAVE 6.1	4.21	4.38	4.94
Visual C++ 5.0	4.45	4.60	5.05
High-End Winstone 98	29.6	30.6	33.6

* Ziff-Davis Winstone 98™ v.1.0

Table 2 shows that, overall, business applications gain 10% from the combined CPU and bus upgrade, with individual gains ranging from over 6% for task switching to almost 12% for word-processing. High-end applications gain more—over 13% overall, with individual gains from close to 9% for Premiere, to over 13% for AVS/Express. This sets the effect of the CPU to 4.5%–13.1% over the bus effect.

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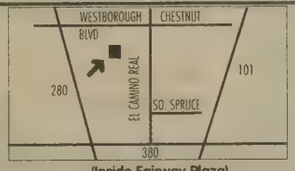

(Inside Fairway Plaza)

Comments

MemBench measures the maximum bandwidth of which the hardware is capable, which is why it shows increases close to CPU and FSB specifications. But the user won't see such increases.

First, Krech points out that compilers do not fully exploit the bandwidth. Second, the pipe metaphor kicks in at the system level too: the processor subsystem is by far the fastest of all and, therefore, except for processor intensive applications (games, high-end graphics with long calculations, video players, compilers), system performance will be determined by the other, much slower subsystems.

As we shall see, relative to the cache and memory throughput in Figure 1, the PCI bus bandwidth is 133MB/sec, of which only about 100MB/sec is reached in practice; the ultrawide SCSI bus offers 40MB/sec and hard disks hover around 10–15MB/sec at best.

The 50% faster FSB, by itself, yields practically no performance gains for business applications on Slot 1 systems. As already explained in a previous article, the L2 cache is integrated into the CPU and runs at half the CPU speed and, therefore, is unaffected by the memory bus speed increase.

At 100MHz, a PII350 improves performance by 6–13% relative to a PII300, but whether it, or the more expensive 400MHz are worth the expense is a subjective decision (keeping in mind that your mileage will vary with your specific applications and how you use them!). Currently, the lowest mail order prices are about $300 for the PII300 and $550 and $800 for the PII350 and PII400 respectively; the other components are priced in Listing 1. For 2D business applications, a fast hard drive and a good 21" monitor that protects your health should have priority over the fastest CPU.

For 2D business applications, a fast hard drive and a good 21" monitor that protects your health should have priority over the fastest CPU.

If you already have a PII233–333, a system board based on a chipset older than LX and without an AGP slot and EDO RAM, you can upgrade to a BX board and, optionally, PC100 SDRAM and take the limited risk of running the CPU at 100MHz (or even achieve 350MHz+ performance by overclocking the CPU itself; more on this in a future article).

If you have a fast regular Pentium, Cyrix or K6, you may want to consider the Super7 option. Because the L2 cache is on the system board and tied to the bus speed, it takes full advantage of the 50% increase in it. In fact, most of the Super7 performance gains come from the bus effect on the L2 cache (which can go up to 2MB vs. the 512KB of the PII). Even though Super7 systems may not outperform their Slot 1 equivalents, they can approach their performance at a lower cost (and can be overclocked too). But the technology needs some maturing. Stay tuned.

(I would like to thank Intelligent Firmware's Michael Krech, Abit's Dennis Yu, ATP's Raymond Liao and Don Dilley and Kingston's Heather Jardim for their cooperation and help) ◆

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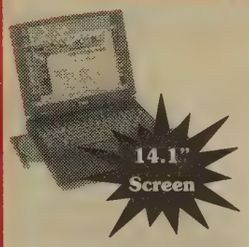

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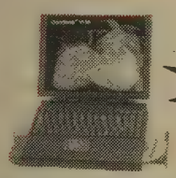

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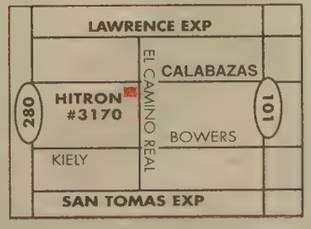

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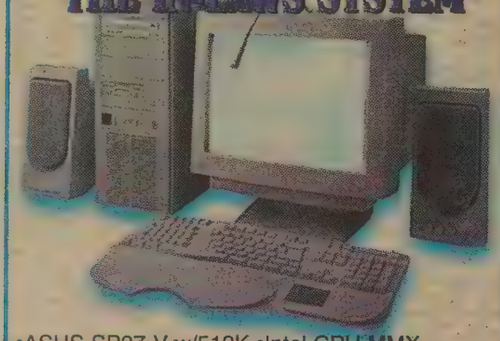

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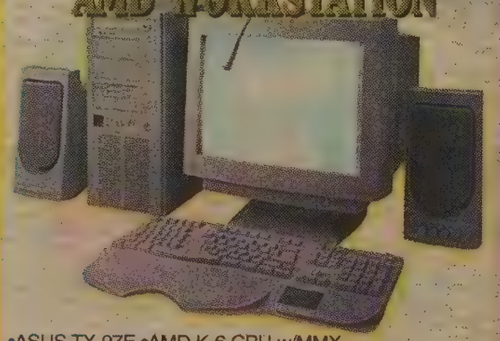

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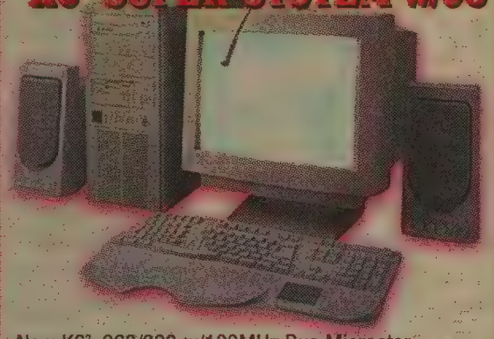

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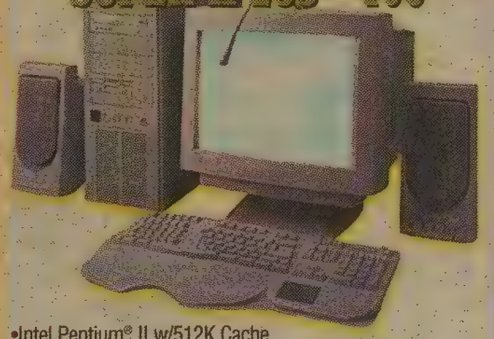

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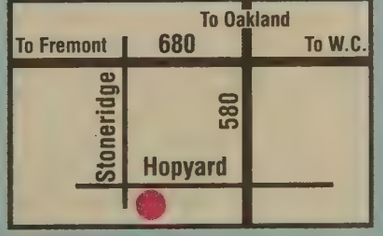


In Gateway Square

Working With Big Documents

Further Explorations In The Cave Of Word

By Birrell Walsh

The skills needed to create a large document are more than, and different from, those needed to work with a small one.

The Story So Far: so you're an overworked small-business operator. You need to save time, but you don't have the money to buy a lot of software. What to do?

The answer may be already on your desktop, as in Microsoft Word. Over the years Word has absorbed feature after feature, most hidden so far down the menus that we call them "The Caves of Word." Great features—and who has the time to find them? Book authors have (see Resources); and following their trail, so have we.

Last month (*www.microtimes.com/180/soho.html*) we looked at how to make macros. Then we put the macros on customized toolbars and menus. Finally we used all these tricks, together with Word's built-in table functions, to build a self-calculating invoice template. You put in the figures and press a button, and the invoice calculates itself.

This month we think about what happens when you suddenly have to build a large document. Someone has come to your office door and said, "Write me a report." Or they said, "Can we subcontract this manual to you?" Or they said, "I want someone to lay out this cookbook for me."

I have found that the skills needed to create a large document are more than, and different from, the skills needed to work with a small one. In a corporation there may be others with experience in large-document layout. In a small office, you are on your own. How do you learn to handle a big test project?

The following is hands-on advice. As with last month's column, it will be helpful to read this one with a copy of Microsoft Word 97 open and running.

Outline!

Do you hear the voice of your third-grade teacher? Well, your teacher was right. Outlining can help make sense of a big document. It can also help you find your way around.

Choose "Outline" on the View menu, and you'll be offered a different way to see your text. You can create headings at many different depths, for ideas and sub-ideas. A new tool bar appears as well, which allows you to promote (the left arrow) or demote (the right arrow) any topic. If you want to insert body text (the stuff you say about a topic), you can do that by hitting the double arrow that faces to the right.

With the Outline view, you can choose how much of the outline structure you want to see. Want just an overview? Click "2" on the toolbar and you will see just the first and second layers of topics. Click "3" and you will see three layers, and so on. Click "All" and you will see all the topic lines, plus all the body text.

You can switch quickly among Outline, Normal, and Page-Layout views by using the View Menu, or by clicking on some truly tiny buttons at the lower left-hand corner of the document window. By switching among the views you can use the organizational advantages of the Outline view, and then jump to Page Layout to make sure everything looks right on the page.

Group Revision

They said, "We want you to write it." They meant, "You write it, and we'll pick it apart line by line."

They said, "You have our complete confidence." They meant, "Eight people will have to sign-off on this document."

Don't go postal. If all the participants are using Word and have email, you can automate much of the revision.

Send each participant a copy of the document by email. Ask them to revise it however they see fit. They don't need to indicate the changes, just make them. Then have them send their revised document back to you by email.

Say your document is called "Manual." When Joe sends back his revision, rename it "Manual—Joe's Revision."

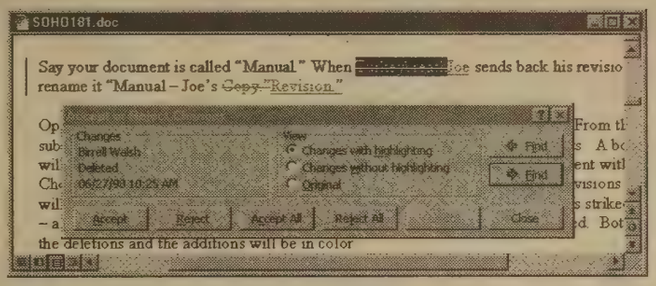
Open your copy of "Manual." Go to the Tools menu, then to Track Changes. From the submenu that opens to the right of Track Changes, choose Compare Documents. A box will open up and ask what document you want to compare your current document with. Choose "Manual—Joe's

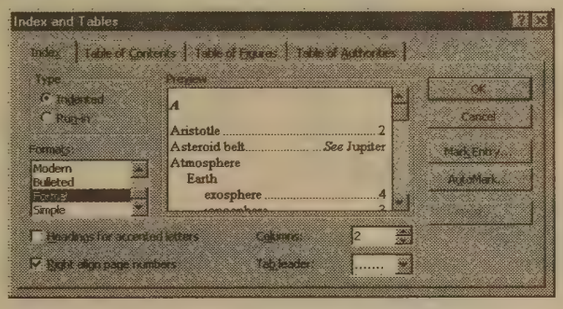
Revision" and hit return. In a moment, all of Joe's revisions will appear on your screen. All the deletions he suggests making will appear as strike-outs—a line will be drawn through the words. All of his additions will be underlined. Both the deletions and the additions will be in color.

Now you need to decide whether to incorporate or discard the proposed revisions. Go back to the Tools Menu, Track Changes, and choose Accept or Reject Changes. This will give you a dialog box that stays open while it steps you through the document. Each proposed revision will be highlighted, and you can accept or reject it as you see fit.

Another way to revise a document is to attach comments to parts of the text. Other reviewers can do this, or you can leave little notes to yourself of things you need to fix.

The nice thing about annotations is that they allow you to say something, without actually changing the document. You can attach an annotation to any part of the text by selecting the part you want to comment on, and choose Insert, then Comment. A box will open up to allow you to add your annotation. When you close the box, there will be a highlight on the text to indicate that there is a comment there. If you put your cursor over the highlighted text, the comment will appear in a small note, floating over the text.





Editing and index tools. Some helpful features hidden in the caves of MS Word 97.

When you have addressed the issue in the comment, you can remove it. Removal is easy—put your cursor over the text that is highlighted and right-click. A small menu will descend, and one choice will be "Delete comment." Choose that item on the menu and the comment will vanish.

Index A Document

When all the people involved have signed-off on the document, someone will come along and suggest that it needs an index.

You do need an index for a large document, but creating one can be a bit of a pain. I know we are supposed to be talking about quick and easy explanations of Word 97 features here, but indexing is just not as easy as some other features.

Creating an index once you've marked the entries is not so bad. Word has a function for that on the Insert menu, called Index and Tables. The real problem is that the process of marking index entries is klutzy. You need to highlight a piece of

continued on page 170

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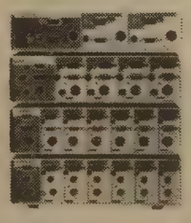

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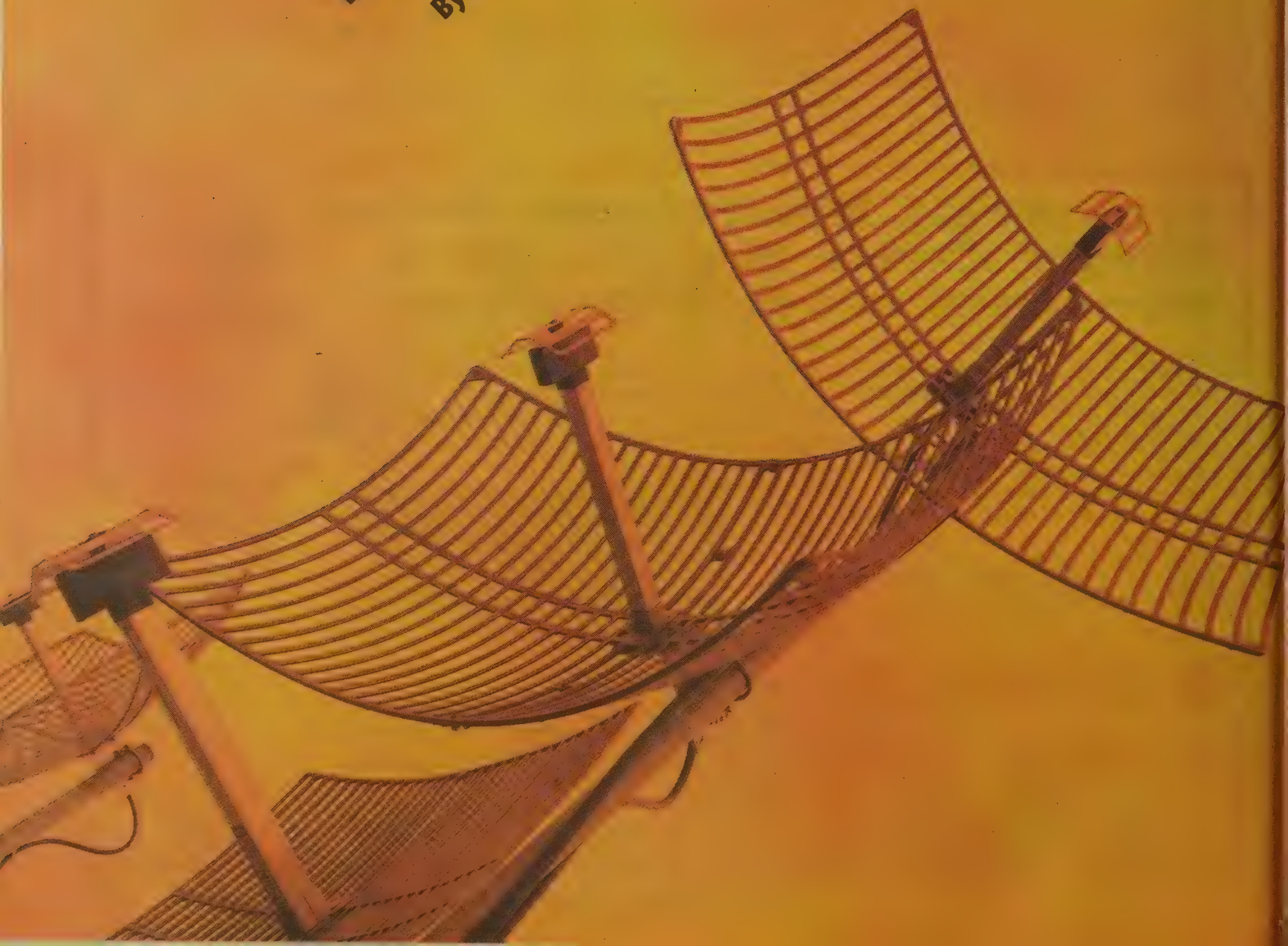
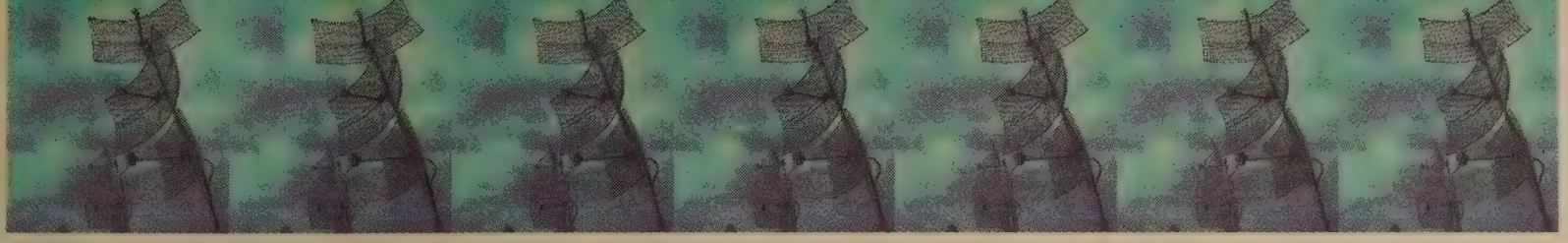
Wireless T1

Innetix Leads Attack On High Costs, Bandwidth Bottleneck

By Mary Eisenhart • Photos: Tustin Ellison





In 1982, while still in the Navy, Kenneth Jackson promoted a successful break dancing event in Aloha Stadium in Hawaii and promptly found himself bitten by the entrepreneurial bug. A few years later in the mid-'80s, as an engineering student at San Jose State University, he learned of an emerging opportunity and was quick to act.

"The FCC was having a lottery, issuing cellular licenses for all the major cities across the United States," he recalls. He immediately gathered friends and resources, and "we applied to some of these cellular markets and participated in the lottery." He applied for licenses in 80 cities, and was successful in acquiring an interest in 40 of them. For the next several years, he continued to apply for licenses in a variety of wireless markets—paging, cellphones, etc.—and to ultimately resell them to larger providers.

"Eventually," he says, "I sold my last major license to a company in Chicago. At that point I had the money to either retire or do something else." After a short period of well-deserved R&R, he found himself ready for his next business challenge.

Correctly figuring that the Internet market was about to explode, he produced a local cable TV program called Internet TV, which gave him "the opportunity to interview all the new movers and shakers in the Valley, trying to find out where this whole Internet thing was going.

"One of the common denominators that kept coming up in our conversation was bandwidth, being able to deliver content in a timely manner to people. So that's when I figured, 'Well, why not provide bandwidth wirelessly?'"

The result was San Jose-based Innetix (*www.innetix.com*), an Internet Access Service Provider that's been offering high-speed wireless Internet connections to its customers for a year and a half, using spread-spectrum technology with 1-watt radios operating chiefly in the no-license 2.4GHz frequency and delivering 1-megabit-per-second speed in each direction.

While the technology itself is not news (see, for example, *www.microtimes.com/metricom.html* and *www.microtimes.com/166/wirelessintro.html*), it has been met by a chorus of naysayers who doubt its robustness and scalability (see, for example, *www.microtimes.com/debate.html*). However, driven by the need for ever-greater bandwidth and frustrated by up to three-month waits for wired connections from the phone company (to say nothing of the monthly charges for those connections), customers found an attractive alternative in Innetix. Not only were they up and running within days (if not hours) of placing their order, Innetix's strategic location across the street from MAE-West and its co-location of servers at AboveNet (*www.microtimes.com/165/colocation.html*) offered direct backbone connectivity for lightning-fast performance.

Since opening its doors, Innetix has acquired an impressive client list in the South Bay, including software companies, the San Jose Convention and Visitors Bureau, the Fairmont Hotel, the San Jose Black Chamber of Commerce, and Joint Venture Silicon Valley.

Jackson, who has financed Innetix's growth from the proceeds of his previous ventures, says he'd ultimately like to take the company public. Meanwhile, he expresses some frustration that its ability to expand is constrained by the fact that the service provider business model doesn't attract investment from the financial community, even though the same investors pour capital into the equipment vendors from whom the ISPs buy.

"We've got people who pay for the service. We've got a customer base; it's growing; we get inquiries every day; we're still signing people up. So we're beyond the theoretical," he says.

"But before this whole wireless thing can take off," he continues, "the financial community has to step to the plate. Right now the financial community has focused on the equipment side of things. Well, you can have all the equipment in the world, but if you can't set up an office service for somebody and get paid for it, all that equipment you have really means nothing.

"The financial community is going to have to be open to service providers, providing those enabling technologies that are going to allow wireless to spread out."

* * * * *

ISPs being pretty thick on the ground in San Jose, what brought you your first customers?

The mayor of San Jose set up a number of software incubators downtown to spur business development. Initially, Pac Bell was providing T1 connections to a number of them at a reduced rate for a year—and after that year they were forced to start paying the normal rate. A T1 connection was going to cost them about $1500 a month, whereas we're able to provide the same bandwidth for half the cost. For the incubators, cost was a major consideration.

How would you assess the reliability of the technology compared to wired lines?

I'd say the reliability of the radios is quite good, just as reliable. When we have issues, it's not with the wireless; it's usually with the wired networks in the configuration. We really haven't had problems with the wireless side of it.

You've got the advantage of extreme proximity to the Internet backbone, with MAE-West across the street and your co-location relationship with AboveNet 'round the corner. How does that work out in practical terms?

What we've found in the marketplace is that customers are much more sophisticated in terms of their connection. When a company is signing up with an ISP, a lot of the time they're going to be running mission-critical applications, so they want you to explain a little bit about your connectivity to the Internet.

Because of that, I made the decision early to co-locate our network at AboveNet and at the actual MAE-West, because it allows multiple connections coming in, multiple pipes for big connections coming in from the Internet. It gives us multiple levels of redundancy, and we're one hop away from the Internet, which means that the end-user is going to receive their information that much quicker.

You're delivering services to people a fair distance from your offices, and delivering over distance has always been one of the problems with wireless. How have you solved those problems?

We've had to not listen to the sales hype and the marketing brochures put out by the radio manufacturers. We've had to go out and field-test the equipment and measure the throughput, and then, based upon the need, we provide that specific radio solution. We've actually had to go out and learn by trial and error what works and what doesn't. When we find something that works, we leave it in place and never move it.

What's likely to affect the radio's ability to work or not?

The distance. For example, if you try to push a radio beyond its listed distance requirements, you're going to have issues. Even if you put an amplifier on that radio, you could still have issues.

I've heard from friends in the wireless business that part of the difficulty in making this technology work stems from the fact that the radios were often designed for use on corporate campuses and never intended to be deployed

in Metropolitan Area Networks. Is this the case here?

Initially they were intended for corporate campuses, but then they started increasing the power and adding amps to it. As long as you stay within the distance limitations, you're okay. Once you start going beyond that, you start having problems.

The challenge has been, how do you configure in such a way that you're not going to violate those distance issues, while at the same time having a customer base within the general vicinity so you can operate a business and make money.

So, for example, the Breezecom (*www.breezecom.com*) radios, which go about three miles, allow us to hit pretty much everything within the downtown area and things close to downtown. When we go beyond three miles, we look at a different radio solution.

One of our prospective clients, Mission College in Santa Clara, requires a 3-meg-per-second connection. We had to shoot that from AboveNet to Mission College through the San Jose Airport. Even though we had radios that said they could do four megs, by the time we put it up, and measured it on the Mission College end, we were only receiving about 1.2.

What is the problem the airport poses?

The only thing we could think of was interference, but most of the frequency the airport uses is 8-900MHz. We couldn't understand whether it was the distance, the frequency, or what, causing the problem.

What we did was go to a different frequency, and got a higher-bandwidth radio. The radio we have now will deliver six megs, so we'll meet their criteria.

What's the power of these radios?

One watt.

And how long a distance can you go between repeaters?

It depends upon the radio. Some of them will go as far as 15 miles, but for us, 15 miles is good enough, because we primarily serve customers within a 10–15 mile radius. That's where the majority of the business is, here in San Jose.

We have a number of customers in the Fremont and Milpitas area—we started with about 10 customers in Fremont. We needed a backbone connection going up to Mt. Allison to be able to serve those customers down in Fremont. In that situation we'd put a higher-bandwidth radio, like a 6-meg radio, as the backbone. It would feed the mountaintop, then from the mountaintop, we'd slice that up and provide bandwidth at some measured rate to the end-user.

Mt. Allison allows us to go into Fremont, Milpitas, the whole Newark area, all the way up in there. Our radios on Mt. Umunhum allow us to service Campbell, Saratoga, Cupertino, Sunnyvale, and Palo Alto.

continued on page 178

Wireless: Coming To An ISP Near You?

For customers fortunate enough to be located in areas where fast wireless Internet access is being deployed, it offers an attractive alternative to the hidden costs of traditional connectivity.

Says Gary Keleman of Clifford Electronics in Chatsworth (*www.clifford.com*): "Recently I received an advertisement from an Internet service provider (ISP) for a full T1 connection to the Internet for only $595. What this ISP didn't advertise is the fact that it is necessary to have a local connection (via Pacific Bell) to the ISP. Only after this is done can you have access to the ISP's T1 connection. Therefore, the hard-to-believe price of $595 is now a more believable $1100."

When Southern California ISP PacificNet (*www.pacificnet.net*) asked him to participate in the beta test of its new InterWireless service, he says, "I jumped at the offer."

He explains: "They promised a full T1 (1.54Mb) connection at a cost less than that of the 384K circuit we had at the time. I was paying $600 per month for the 384K circuit to PacificNet (our ISP) and approximately $500 to Pacific Bell for the local loop to PacificNet, making the total cost around $1100." InterWireless rates range from $175 per month for 128K to $900 for full T1.

Keleman adds that while there were some concerns about the technology's reliability, experience has so far proved them unfounded. "With a wireless connection, the local loop is severed. The connection to the ISP (InterWireless) is direct, thus reducing the chance of downtime should the local carrier have problems. The added bonus of zero downtime since making the switch to wireless only adds to my belief that I made the right decision."

Cost, reliability, and the lengthening wait for lines from the local telco are driving a number of California ISPs to add wireless connectivity to their service offerings. Among them:

Northern California

CKNS.net

(www.ckns.net)

ISP CKNS will soon be adding wireless connectivity to its service offering for customers in greater Silicon Valley.

Innetix (see main story)

www.innetix.com

Service area: greater Silicon Valley; Oakland and San Francisco in progress.

Wavepath

www.wavepath.com

Wavepath expects to launch its initial service offering in the South Bay/San Jose area sometime in July, with full Bay Area coverage later in the year.

Southern California

Global Pacific Internet

www.globalpac.com

Global Pacific currently offers high-speed wireless connectivity from 384K to 3+mbps to customers in Orange County. As part of its expansion effort into Los Angeles County, says marketing director Lou Valliere, GlobalPac will also offer customers temporary wired T1s at the lower wireless rate until there are enough customers in the area to make installing a transmitter in the area feasible.

InterWireless

www.interwireless.com

InterWireless offers wireless connectivity up to 15+mbps to business customers in the greater Los Angeles area, from Oxnard to north Orange County.

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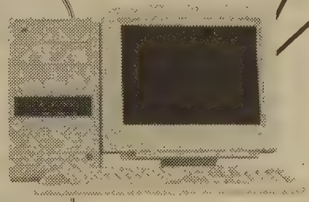

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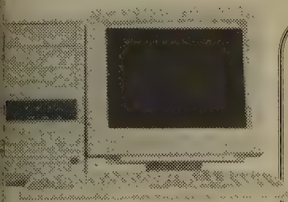

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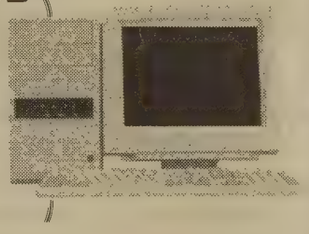

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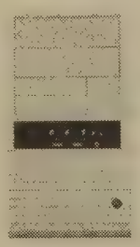

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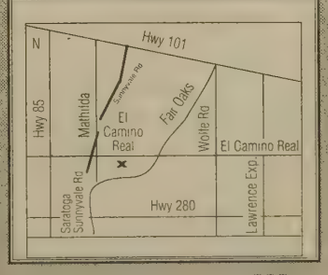

Bluetooth: The Missing Link?

The Marriage Of Communications And Computing | By Andrew M. Seybold

Imagine that you are in a meeting with your notebook computer open in front of you. Suddenly, the cursor begins to blink and a new email message is displayed on the screen. Your computer isn't plugged into anything, your cellular phone is in your briefcase under the table, but you are receiving email over the wireless network. How is this possible?

Your notebook is communicating with your cell phone, which in turn is communicating with the wireless network through a revolutionary new radio chip developed through a collaboration of the computing and communications industries—code name "Bluetooth."

Setting The Stage

Over the past ten years or so, the communications and computer industries have developed new technology products that enable mobile workers to be more productive. As a result, our work force is able to spend more working hours in the field.

The communications industry has given us pagers that have evolved from tone-only to belt-worn devices that can receive and display text messages of up to several hundred characters. Mobile phones have evolved from large vehicle-mounted units to today's handheld phones weighing only a few ounces. Mobile phone service has grown from coverage along major highways to coverage virtually everywhere we go.

> Why not build a single, common radio into every mobile computer?

Meanwhile, the computer industry has provided portable computers that have evolved from luggables to palmtops. Today, you can carry computing power in your briefcase that is comparable to yesterday's corporate-wide data processing capabilities. Today's mobile workers have a wide range of portable computers to choose from—full-function notebook computers with several hours of battery life, smaller and lighter full-function notebooks, still lighter mobile computers, handheld PCs, and palmtop PCs with the ability to operate for fifty or more hours on a set of batteries.

The Past Few Years

During this same time, first facsimile, and now electronic mail have taken us beyond voice communications. Today's mobile workers number some 45 million in the United States alone, and they need more than a cellular phone and a mobile computer. They need the ability to access their own email, connect to their corporate information resources, and perhaps to send and receive faxes.

The Merger

The computing and communications industries have both been building smaller, more powerful devices for mobile workers and consumers. The next logical step was to work together to provide wireless access to computing devices. For five or six years, the industries have been doing just that—working together toward providing customers with the same level of access to their computing data as they have to people via their mobile voice phones.

Wireless networks that were deployed for voice traffic have been expanded in scope to serve as wireless data pipes as well. Further, in more than a dozen countries including the United States, data-only wireless networks have been built and put into service.

However, using a wireless network for data today is much more complex than for voice. A voice wireless phone is easy to understand and use. You pick it up and dial a number. The phone at the other end rings, someone answers, and you talk. It is almost exactly like using a wired phone, and you can dial any phone number in the world.

Early wireless voice systems are analog networks, and using an analog wireless network for data is difficult at best. You must purchase a cable and wireless modem to connect your phone to the computer, and you must use a data speed that is considerably slower than wired modem access. Even then, the connection is susceptible to interference or being dropped altogether.

Enter Digital

All of the new wireless voice systems being implemented today are based on digital technologies, as are data-only networks. Meanwhile, most analog wireless networks are being upgraded to digital. Digital networks are better suited to data, and most are capable of providing for both voice and data. Even so, it is still necessary to purchase a wireless network adapter or modem as well as proprietary cables and connectors for the computer in order to use these new networks for wireless data.

Wireless network adapters can be connected to a cellular phone with a cable, or they can be complete wireless communications devices, and they are designed to fit into a PC Card slot of a mobile computer. In many cases, it is also necessary to install special software to enable the computer and the communications device to communicate with each other.

Connections

Once the mobile computer is connected to the wireless network via the network card or modem, users must be able to access the information they want and need over the network. While the demand for such a connection is high, the actual number of users is still small. Thus, corporate information managers have not yet addressed the issue of making it easy for their own corporation's employees to connect back into their corporate data resources wirelessly.

Wireless voice communications are easy to procure and use—there are millions of wireless phones in use worldwide. On the other hand, wireless data communications are still difficult to implement, and today's users number only in the thousands. For these reasons, communications and computing companies have both slowed in their efforts to merge the two technologies.

Renewed Interest

With the recent success of palmtop and handheld computers, as well as the emergence of a new generation of still smaller and lighter mobile computers, there is renewed interest within the computing community for wireless data access. Further, as more wireless networks come online, network providers are finding it necessary to offer services beyond voice to maintain a competitive edge.

Problems Remain

Even with this renewed interest, and technical advances made by both industries, implementing

wireless data remains a complex and expensive proposition. Because there are so many wide-area networks that can be used for wireless data, and there are so many digital standards, computer vendors have been frustrated in their efforts to build wireless communications solutions into their mobile computers.

As a result, communications companies have had to find ways to enable their communications devices in the computing world. They offer products that fit directly into a mobile computer, some that connect to the computer via a cable and a PC Card and, soon, there will be devices that provide for an infrared communications link.

None of these are ideal solutions—each comes with its own set of problems. For example, each mobile phone vendor uses a different type of connector on its phone, thus a wide variety of interface cables must be provided. Each network operates on a different set of radio frequencies and may use a different digital standard; thus every mobile computer cannot be engineered to work with every device. And computers generate radio noise—interference can be experienced by either device when a wireless adapter is inserted into a computer, or even when they are connected via a cable.

The infrared solution has turned out to be problematical because it is designed to be used over short distances and has a small "target" area. The two devices must be positioned so that their IR ports can "talk" to each other. Some devices have IR ports on the back, some on the side, and so on. Moreover, the IR solution does not permit one-handed operation of the computer and communications device. Since one-handed operation is an important feature of smaller handheld and palmtop computing devices, infrared is also an inconvenient solution.

The communications industry has been trying to find a solution that will enable mobile computing devices to connect to their wireless networks. Computer companies have been trying to find a way to connect their devices to wireless networks. While they share the same goal, each industry has been focusing on its own technology without adequate consideration of the requirements of the other.

Eventually, several companies from both industries decided that they needed to work together to find a common solution. They knew that there was a demand to merge mobile computing with mobile communications, and they understood the problems. They believed that working together they could find a solution.

The Result

The result of this collaboration will be a technology code-named "Bluetooth." I expect Bluetooth to address all of the issues raised above, and it will provide a common solution for both industries. The model for Bluetooth is simple, and there is genius in its simplicity.

Rather than trying to design computers so they will work with any wireless interface card or modem on any frequency, using any one of a number of digital technologies, why not build a single, common radio into every mobile computer?

The computer and radio combination could then be optimized to minimize interference—a task made easier for computer engineers with only one radio. With a single-radio solution, computer vendors will no longer be faced with having to make a network choice or supporting multiple networks.

The Bluetooth communications device is a small, low-powered radio in a chip that will "talk" to other Bluetooth-enabled products, eliminating the need for cables or infrared beams to connect portable computers, cellular phones, printers, fax machines, etc. It will be possible to connect enabled devices on a one-to-one or one-to-many basis.

Since the chip supports both voice and data communications, applications will range from something as simple as replacing the cable between a mobile computer and cellular phone, to more complex connections involving multiple computers, and extending into hands-free voice communications for wireless phones in vehicles.

Everybody Wins

Bluetooth appears to be a win for the computer industry. Most computer manufacturers have wanted to enable wireless communications, but have been unable to determine which wide-area networks to support. The Bluetooth solution will eliminate the need for a wide-area network decision. This can be left to the makers of phones and modems and other wide-area network devices. As an added bonus, the radio, which is inexpensive to build in, can be used to connect any two or more devices that are equipped with the radio module.

Computer manufacturers have known for some time that wireless communications will be important for mobile computers. The Bluetooth solution will provide a short-range *ad hoc* network, enabling users to send and receive email without a phone and synchronize their calendar and phone book automatically whenever the two devices detect each other's presence.

Bluetooth also appears to be a win for the communications industry. Communications companies will no longer have to build external cables and PC Cards to enable their wireless phones and network cards to interface to computers. A Bluetooth module built into the phone or wireless network connection points will enable it to send and receive information to and from any computer so equipped.

Since Bluetooth is capable of short-range voice communications as well, it will also be used as a hands-free voice interface for cellular phones, a speaker-phone link, and a link between the phone and other electronics in an automobile. Bluetooth technology will enable multiple devices to communicate with each other using a common set of standards when they are within range.

Today's mobile workers number some 45 million in the United States alone.

Built-In Devices

The "compelling" reasons for incorporating Bluetooth are to wirelessly connect mobile computers to cellular phones, and to establish small workgroups quickly and easily. As the number of Bluetooth-equipped devices grows, so will their uses. Printers, fax machines, LANs, and more will be able to communicate with each other.

On the communications side, cellular phones, two-way pagers, wireless data-only terminals, and most other two-way wireless-capable devices will be Bluetooth-equipped. Bluetooth will provide the "glue" for the merger of wireless and computers. And it will provide some great new voice options as well.

Add-In And Add-On

While I expect to see many new computer products that include radio modules to enter the marketplace, I also expect to see many computer companies build add-in and add-on modules to enable existing wireless and computing combina-

tions. Soon after such products come to market, I expect to see printer and network adapters as well as adapters for wireless phones and mobile computers already on the market.

Bluetooth offers a universal solution to what has been a perplexing connectivity problem, and I expect to see wide adoption of this technology. It is being packaged for the OEM as a certified module at a low cost—I think that it is a "no-brainer" when it comes to deciding whether to build the technology into new products.

A Look At Bluetooth

The Bluetooth wireless technology will use one of the available unlicensed, yet virtually worldwide radio bands—2.4 GHz—and it can support both voice and data. Everything needed to be Bluetooth-capable will be contained in a module that will cost between $15 and $20 at first. Driven by volume, the cost should drop to about $5 by 2001.

The low-power radio module can and will be built into mobile computers, mobile phones, printers, fax machines, and network connection points. While its primary focus is to be the wireless connection between mobile computers and/or between computers and wireless network devices such as cellular phones, Bluetooth supports data speeds of up to 721 Kbps (including a 56 Kbps back channel) as well as three voice channels.

The Bluetooth design is a collaborative effort between communications and computing companies. Ericsson and Nokia independently were working on similar radio concepts. They understood the need for a partner on the computer side; each approached Intel with the idea. Intel quickly grasped the importance of the concept and has been instrumental in driving the concept to reality. The initial group working on Bluetooth also includes IBM, Toshiba, Motorola, and Palm (3Com).

Because of the close collaboration and input from both industries in the final design, Bluetooth will provide flexibility that reaches beyond simply being a replacement for wire.

Bluetooth has been designed to operate in a multi-user environment. Devices can be enabled to communicate with each other by the computer or communications device end user. Up to eight users or devices can make up a piconet, and ten piconets can co-exist in the same coverage range. Since each link is encoded and protected against both eavesdropping and interference, Bluetooth can be considered a secure short-range wireless network.

Conclusions

I am really excited about this technology and what it will mean to mobile computing and communications. To me, Bluetooth represents a no-brainer concept at a reasonable price. I believe that any computer vendor building mobile devices should embrace this concept and these products—immediately if not sooner!

The same goes for mobile phone, wireless modem, and network adapter vendors. While it might take a while for this module to show up in smaller phones, most can certainly accommodate the module when it comes to size and current drain. As the number of Bluetooth devices on the market increases, prices for the module will continue to come down to a point where it is comparable to building in IrDA-compliant infrared, which is a common practice today.

I also believe that printer, fax, and other accessory device vendors will be quick to hop on the Bluetooth bandwagon. Imagine being able to print without cables or aiming an infrared beam. Imagine walking into your office and putting your briefcase down and having the notebook computer inside it automatically sense that it is in range of your desktop and initiate the exchange of data to update both systems.

Of course, the primary advantage to this system is that computer vendors *can build it in.* They don't have to worry about choosing a wide-area network to support, or stocking an assortment of modules for several networks. And their engineers need only minimize interference for *one* radio on *one* frequency band! Further, enabling their computers for wireless data communications will not require a PC Card slot or option bay cavity—these will remain available for other uses.

Bluetooth has been designed to solve a number of connectivity problems experienced by mobile workers and consumers. And it does so in a simple, neat package that is inexpensive—the OEM only pays for the cost of the module. The system is available royalty and license free.

Bluetooth was well conceived, and I believe that it will be well received. I will certainly encourage all of my clients to make Bluetooth a part of their strategy as they move forward. My only disappointment is that I have to wait until mid-1999 before I can have a Bluetooth-enabled set of mobile computing and communications devices. ◆

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Table 1: Bluetooth Specifications*

Frequency Band:	2.4 GHz (unlicensed ISM Band)
Transmitter Power:	1 milliWatt (0 dBm)
Technology:	Spread Spectrum Hybrid Direct sequence and frequency hopping
Maximum Voice Channels:	3 per piconet
Maximum Data Channels:	7 per piconet
Data Speed:	721 Kbps per piconet
Expected System Range:	10 meters (40 feet)
Number of Devices Supported:	8 per piconet, 10 piconets in coverage area[1]
Security:	Yes, link layer
Power Requirement:	2.7 volts
Power Consumption:	30 uA sleep, 60 uA hold, 300 uA standby 8-30 mA transmitting
Module Size:	0.5 square inches
Interference:	Bluetooth minimizes potential interference by employing fast frequency hopping—1600 times a second.

* Features currently planned are subject to change without any notice. Actual features may vary.

[1] Graceful degradation of the symbol rate for more than 10 piconets in a given coverage area.

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Steve Moore
Issue #181 examines various aspects of wireless and mobile computing. In our cover story, entrepreneur Kenneth Jackson explains the thinking behind his company Innetix, a San Jose-based Internet Access Service Provider specializing in fast wireless connectivity, and how current market conditions are driving the growth of wireless.
Andy Seybold explains Bluetooth, an emerging standard that could revolutionize wireless communications.
In mobile-related articles, Doug Nakahara looks at the newly-released Palm III, Peter Linde sings the praises of his Ricochet wireless connection, and Sam Penrose reviews the new G3 PowerBooks.
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The Wireless PowerBook

Plus: Speeding Up Your Mac's Browser

By Peter Linde and Sam Penrose

This month, Peter will talk about his experiences with Metricom's Ricochet wireless modems, and Sam will follow up his recent column on the speed of Macs as Web clients.

World Without Wires

By Peter Linde

Three peripherals have fundamentally altered the way I use my computer.

The first was my original ImageWriter II printer. At last, I was able to take what was on the screen and spit it out into the real world.

The second was my first 2400 baud modem. No longer was I limited by my 40 Meg hard drive. BBSes, the Internet, Shareware, Freeware, viruses—they were all there for me to discover.

The third peripheral, the one that's most radically altered how I use my computer, is my Ricochet wireless modem.

A Ricochet modem connects to my computer just like a normal modem. I can make a PPP connection to the Internet, just like with a real modem. I can do just about anything with it that I would do with a normal modem.

But unlike a normal modem, the Ricochet never needs a phone line in order for me to connect. It connects to its own proprietary network of radio transmitters spread all over the Bay Area and a growing list of other cities.

Point your browser to *www.ricochet.net/coverage/* for an almost up-to-date list of their coverage areas. I say "almost up-to-date" for two reasons: The coverage areas seem to grow daily, and I've found cities with service that are not even mentioned on their site. For example, I've used my Ricochet in West Los Angeles, which, as far as I can tell, is fully covered, yet not mentioned anywhere on the Ricochet site.

It Must Be Expensive!

You might assume that any kind of wireless modem would be expensive to operate. Ricochets cost only about thirty bucks a month for as much connect time as you can use. In fact, the company all but encourages you to stay connected full-time!

They can afford this because the system uses a "packet radio" network. In English, this means that your modem only uses up bandwidth during the moments that it is sending or receiving data. The rest of the time, it just sits there using no resources (other than battery power).

How Fast is It?

This is a tad complex to answer. Metricom, Ricochet's parent company, claims that the modems operate at about 28.8Kbps, but I frequently achieve much higher throughput. I also, at times, connect at a much lower rate. Both the nature of the system (packet radio) and your proximity to one of their repeaters can affect your connection speed. The actual speed that each packet transmits at is much faster than a 28.8 modem; however, the time between packets, known as the latency, can bring the effective speed of the modem down. Depending on the quality of your connection, this latency can be negligible or it can make your Ricochet act like a 300 baud modem, or even worse. In general, the company's conservative claim is a good average to count on.

Ricochet is in the process of upgrading to a new, high-speed network which they claim will achieve speeds up to 128Kbps. The only bad news about this is that the modem you buy today won't be compatible with that system—thus you will need to buy a new one to take advantage of the speed gain.

It's About Lifestyle

The real benefits of the Ricochet modem have little to do with the technical issues. It really comes down to a matter of lifestyle and how this little modem can alter yours.

Most people who access the Internet have to plan their access in advance. Even if you are a road warrior with a PowerBook and a regular modem, you must still pick the time in your day when you can find a phone line and dial in to the Net. Now, as long as you move within the Ricochet's ever-expanding network, you simply whip out your computer and modem and connect. I have checked my mail from my car, from the top of a mountain, from most of my clients' offices, from cafes, etc. But even within my home, I don't have to think about going in a certain room to check mail.

Miles Hurwitz, BMUG board member and Ricochet user, says, "Even at home, I can choose the living room or the kitchen, without thinking about it. It allows me to multi-task. I can watch bad TV while pulling down email and I don't have to feel guilty about wasting time. It's freeing!"

Is It Safe?

My mom would be mad at me if I didn't mention the safety issues involved with RF (radio frequency) devices.

Depending on the quality of your connection, access may be quite speedy or reminiscent of a 300 baud modem.

While studies are inconclusive about the possible health effects of long-term exposure to RF fields, it's always wise to be cautious. The Ricochet Web site has a brief discussion about this, but mostly they just talk about being far below all government limits for fields generated by their devices.

In general, a Ricochet is similar to a 900 MHz cordless phone. My advice is to try to work so that the antenna isn't resting against your body. The modem comes with Velcro strips so that you can attach it to the lid of your computer. This is the perfect place, as it keeps the antenna off your lap, and raises it as high as is practical for optimal connection.

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Living In A World Without Wires

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Although it is a great product right now, I look forward to their faster network and wider coverage area.

Please send comments or questions to *pbl@lindegroup.com* or *MicroTimes_Column @bmug.org* . Thanks!

Macs As Web Clients, Part II

By Sam Penrose

Two months ago (see *www.microtimes.com/179/bmug.html#sam*), I reported that many users found Macs slower Web clients than comparable Windows machines. It was not possible to nail down the dimensions or causes of the problem, but some potential solutions have been identified in Apple's plans and in email from *MicroTimes* readers.

> Ever since Web browsers first appeared on the Mac, memory management has been cited as key to getting the best user experience.

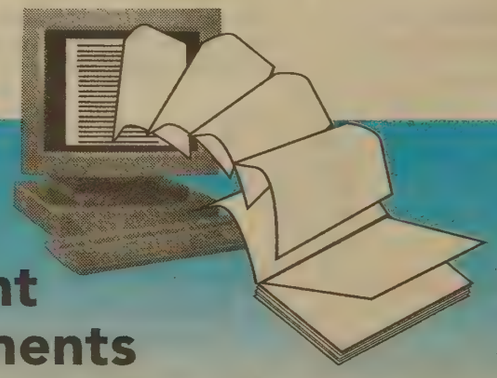
First, the bad news. Apple does not intend to replace the outdated underpinnings of Mac OS with a modern kernel until late in 1999. That solution, Mac OS X ("Ten"), may not run on Macs prior to the current G3 line. If the outdated code base is responsible for the problem, older Macs are stuck with it.

Now the good news: Web performance on all Macs can be improved with some inexpensive changes. For those with larger budgets, the newest Macs offer excellent performance even without a modern OS.

A Consensus Emerges

Ever since Web browsers first appeared on the Mac, memory management has been cited as key to getting the best user experience. One trick involves creating a RAM disk to hold the browser's cache, preventing slower hard drive access.

Memory management surfaced again in a response from reader Bob Peterson. He lists several ways to improve performance, some of them contrary to conventional wisdom. They include turning off virtual memory, increasing the Finder's disk cache to 5MB (both via the Memory Control Panel), and increasing the browser's RAM partition to 16MB for Internet Explorer and 32MB for Netscape Navigator. (To change an application's RAM partition, select its icon in the Finder, choose Get Info, and adjust the "preferred size" field.)



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Testing on a new PowerBook G3/233 and a four year old Power Mac 7100/66 seemed to support Peterson's claims. Pages loaded faster on both machines. On the G3 the difference was especially dramatic, probably because the gap between hard drive and processor speed is larger. These results cannot be taken as proof (particularly of the precise values Peterson reports), but reconfiguring your machines for an experiment takes only a few moments if you have the RAM. If you don't have the RAM, most types now cost just over $1/MB.

Try a Faster Mac

The brute force solution to Web performance is to buy a new Mac. The G3s (including the iMac) are twice as fast as the models they replaced and nearly 10 times faster than the original Power Macs. They appeal because details become irrelevant: given enough RAM, they'll overwhelm most OS bottlenecks.

If you aren't ready to get a new machine, Connectix' SpeedDoubler, a faster graphics card, or a faster hard drive should all boost performance.

A Naughty Hack

BMUG Executive Director Hal Gibson suggests hacking Netscape Navigator by increasing the portion of its RAM partition devoted to caching recently visited pages to make them reload faster. While a less comprehensive solution that those mentioned above, this hack involves messing around with parts of your computer that sober software vendors would prefer you leave alone—just the spirit we like to encourage (when appropriate) at BMUG!

The brute force solution to Web performance is to buy a new Mac.

Do not attempt this unless you have backed everything up and have time to recover from any damage you may cause to your files. You'll need a utility that can change file type and creator.

- Make sure Navigator is not running.
- Copy the Netscape Preferences file. Move the original someplace safe.
- Change the copy's type and creator to "TEXT" and "txt."
- Open it with SimpleText. (You'll note the first line says "Don't modify this file!")
- Add a line (towards the top; you'll see similar lines) that reads, precisely: "user_pref ("browser.cache.memory_cache_size", 4096)"
- Save the file. Restore its type and creator to "pref" and "MOSS".
- Increase Navigator's RAM partition by 4096K

If you didn't understand any of these instructions, don't try this. If you forget the semicolon or add a space, bad things may happen. If you adjust any other settings inside of Navigator, it will rewrite the file, probably erasing your hack.

Thanks to all those mentioned, as well as to a reader who did not respond to my request for permission to quote him. Feedback welcome at *MicroTimes_Column@bmug.org* . ◆

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Pac Bell Rolls Out ADSL

Fast Net Access—If You're In A Served Area

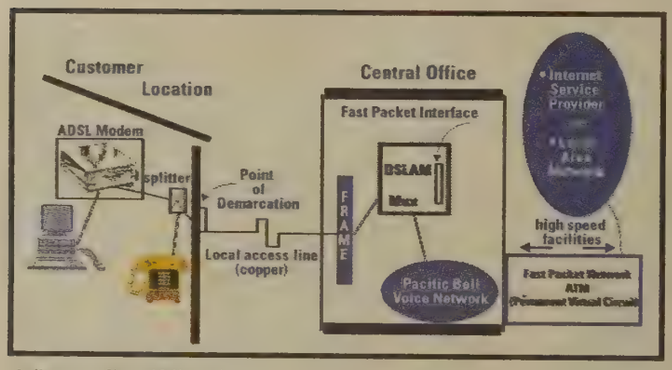
By Bill Gram-Reefer

ADSL enables businesses of all sizes to work smarter, and home Internet users to surf faster.

Pacific Bell announced it will begin broad deployment of high-speed Asymmetrical Digital Subscriber Line (ADSL) service in more than 200 communities across California to satisfy customer demand for bandwidth and faster Internet access.

Designed primarily for Internet and telecommuting applications, ADSL enables businesses of all sizes to work smarter, and home Internet users to surf faster. Packaged with Internet service, ADSL promises online consumers and small businesses faster access to the World Wide Web. ADSL also enables telecommuting employees to connect to their employers' corporate networks via dedicated, secure links.

Following a market trial of ADSL last fall in select areas, Pacific Bell plans to initially deploy ADSL in 87 central offices, serving all or part of more than 200 communities throughout the state. By the end of the summer, cities such as San Jose, San Francisco, Oakland, Anaheim, Los Angeles, San Diego, and Sacramento will have Pacific Bell ADSL service. According to Pac Bell, the ADSL-equipped central offices currently will serve about 4.4 million households and 650,000 business customers.



A diagram of how ADSL works

ADSL provides secure, dedicated links to corporate networks and the Internet at transmission speeds of up to 1.5 megabits per second (Mbps)—50 times faster than 28.8 kilobits per second (Kbps) modem speeds. By comparison, it would take a 28.8 Kbps modem 41 minutes to download a short video clip (72 Mbps) that could be downloaded in 48 seconds using ADSL technology. It is also a high-speed, always-on, direct Internet access solution that enables users to download data, graphics, audio and video files over existing telephone lines while simultaneously using a phone or fax machine.

FasTrak DSL

Marketed as Pacific Bell FasTrak DSL, the setup requires a compatible ADSL modem at your home or remote location. Initially, these modems will be provided by Alcatel. The ADSL modem is connected to your PC or Macintosh computer by either an Ethernet or an ATM25 Network Interface Card (NIC). A device called a splitter is the interface between your ADSL modem and the copper phone lines at your home or office. Pacific Bell will work with customers to coordinate orders, hooking up to your LAN or Internet service provider, as well as delivery and installation of your FasTrak DSL line and equipment, including your ADSL modem and splitter.

The minimum computer requirements for FasTrak DSL are:

- 486 or better PC (Pentium recommended) with Windows 3.1, 3.11, '95 or better
- Macintosh 68030 or better running System 7.0 or better
- Windows NT workstation and server
- UNIX workstation (e.g. Sun and HP)
- a minimum of 8MB RAM and 25MB available hard disk space

plus a Network InterfaceCard (NIC) in the personal computer.

FasTrak DSL requires no new phone connections as it delivers high-speed data access over your existing POTS (plain old telephone service) line, allowing you to use your voice line while maintaining your high-speed data connection.

You must be qualified to ensure that your access line meets FasTrak DSL specifications, which include a maximum distance from your Pacific Bell central office of 2–3 miles. Pacific Bell will check your line for you in advance of ordering FasTrak DSL. To deliver megabit speed over standard phone lines, your corporate LAN or Internet service provider will need to be connected to the Pacific Bell ATM network.

Package Options

Three ADSL offerings will be available from the company following a rubber stamp PUC regulatory approval process:

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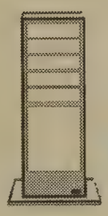

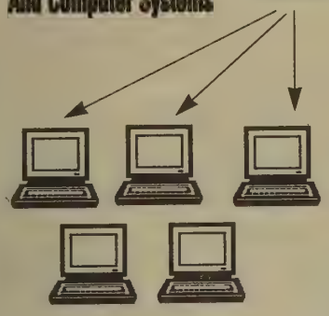

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nection plus Internet service, and is designed for high-volume home Internet users. Home Pack provides transport speeds starting at 384 kilobits per second (Kbps) downstream and 128 Kbps upstream. Total monthly price for home Internet access package starts at $89, including $59 ADSL connection and $30 dedicated Internet service from Pacific Bell Internet Services.

The Internet Access Pack DSL also includes the ADSL connection and Internet service, and is designed to meet the higher-speed Internet access needs of all businesses. Internet Access Pack includes two speed options: up to 384 Kbps downstream and 384 Kbps upstream to meet the needs of small office/home office (SOHO) and small businesses requiring Internet access. Total monthly price for this business Internet package starts at $199, including $99 ADSL connection and $100 dedicated Internet service from Pacific Bell Internet Services.

Alternatively, you could select up to 1.5 megabits per second (Mbps) downstream and 384 Kbps upstream if you require more bandwidth, as in the case of medium and large businesses where many employees share a single Internet connection. Total monthly price for the business Internet package for small offices starts at $339, including $189 ADSL connection and $150 dedicated Internet service from Pacific Bell Internet Services.

Office Pack DSL includes the ADSL service only and is designed to meet the dedicated and secure remote access needs of large business customers. Office Pack includes two speed options: up to 1.5 Mbps downstream and 384 Kbps upstream. Total monthly price for a high-speed corporate network connection is $189 for up to 384 Kbps downstream and 384 Kbps upstream. Total monthly price for high-speed corporate network connection is $99 without the IP service.

Additional charges may apply for purchases of customer premise equipment and network integration services.

The actual throughput rate that a customer obtains may depend on the associated ISP network, the Internet, or some corporate LAN, among other things. Pacific Bell promises to make every attempt to connect the customer's service at the option speed they choose. However, Pac Bell's DSL service is provided with a best-effort (Unspecified Bit Rate) Quality of Service on the ATM backbone, and as such, does not guarantee a specific constant throughput rate.

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ADSL Availability

Alphabetical listing of Central Offices where Pac Bell will begin to install ADSL this summer:

Alameda	Garden Grove	Pleasanton
Albany	Glendale	Redwood City
Alhambra	Hayward	Sacramento (4)
Anaheim (2)	Hollywood	Reseda
Arcadia	Irvine	San Bruno
Berkeley	La Crescenta	San Carlos
Beverly Hills	La Jolla	San Diego
Burbank	La Mesa	San Francisco (5)
Burlingame	Laguna Niguel	San Gabriel
Canoga Park	Livermore	San Jose (5)
Colma	Los Altos	San Mateo
Compton	Los Angeles (5)	San Ramon
Concord	Milpitas	Santa Ana (2)
Costa Mesa	Mountain View	Santa Clara (2)
Culver City	National City	Sherman Oaks
Danville (2)	Newport Beach	Simi Valley
El Toro	Northridge	Sunnyvale
Escondido	North Hollywood	Tustin
Fair Oaks	Oakland (3)	Van Nuys
Fremont (2)	Palo Alto (2)	Ventura (2)
Fullerton	Pasadena	Walnut Creek

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- P6BXIS-233~400+,P2,440BX,4xPCI/3xISA/AGP/Raid,2940UW,2xUIDE,USB,Dim,ATX..... $ 255
- P6BXI-233-400+,P2,440BX,4xPCI/3xISA/AGP,2xUIDE,4xDim,USB,Award,ATX..... $ 155
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- P5MVP3-75~300MMX/K6,MVP3,512K,3xPCI/3xISA/AGP,2xIDE,2S/1P,4x72/2x168,AT..... $ 89
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- P6SLS-233~333+,P2,440LX,4xPCI/3xISA/AGP,2940UW/2xUIDE/IO,2S/1P,4xDim,ATX..... $ 209
- P6SLA-233~333+,P2,440LX,4xPCI/3xISA/AGP,2xUlta/IDE/IO,2S/1P,3xDim,2xUSB,ATX.... $ 109
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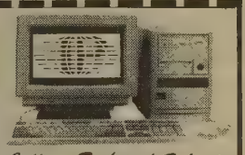

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Pentium-II-300Mhz,w/512kcache	$959
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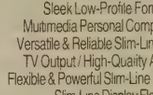

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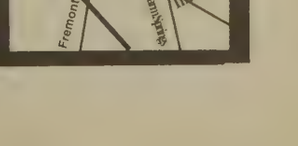

Selective Access, Or, Who Gets ADSL?

In the beginning, Pac Bell believes that 70–75% of customers out of a given central office will qualify for the service. Additionally, the evolution of the network technology eventually will allow Pac Bell to decide how much it is worth to reach the small percentage of customers who are on the most distant ends of local networks or live in places like Clear Lake, Novato, or Barstow.

And that brings up an interesting issue. There are lots of towns not on the list for conversion. There are also lots of Central Offices left off the list, even though a community is mentioned on Pac Bell's list of locales that will receive high-speed service. While Concord is included, for instance, only the central office out on Clayton Road will be converted this summer, beginning in July. According to a Pac Bell representative I talked to, the central office located downtown isn't scheduled for conversion until 1999.

This means only the businesses, residences and SOHOs located in Concord's more well-to-do areas will be able to take advantage of faster Internet connections. Because the central office downtown is not being converted, city offices, all of the businesses located along the Willow Pass corridor (including the Gateway complex), and residences located on the western side of Concord will get short shrift.

Maybe Pac Bell doesn't think there's any profit in offering ADSL in those areas. So just do the areas with higher household incomes.

Do you call this "cherry-picking" or "redlining?" Either way, I find it discriminatory behavior by a public utility, as it skims the cream off the top instead of serving all of its customers equally. While in theory this allows the telcos to bootstrap future development by serving the more revenue-producing markets first, in reality it is more designed to make entry into the market by competitors prohibitive.

Historically the Baby Bells have argued that new competitors will come into the market and use the telco's infrastructure to cherry-pick the best customers, while the PUC holds the regulated utilities to serving the entire area with lifeline service, etc. But now, as they've successfully stonewalled competition, they can further discourage competing CLECs from colocating equipment in COs serving those lower-income areas by staking out the more lucrative areas themselves, creating a situation where some people, based on where they can afford to live, are de facto more equal than others. ◆

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Consumer Privacy On The Web

The FTC Reports On What Industry Is Doing—Or Not Doing—To Ensure Privacy Online

By Michael Robin

There is rarely an enforcement mechanism to ensure widespread adoption of online privacy guidelines.

In June 1998, the Federal Trade Commission released *Privacy Online: A Report to Congress*, its assessment of the effectiveness of the online industry's self-regulation as a means of protecting consumer privacy on the Web. The report concluded that "industry's efforts to encourage voluntary adoption of the most basic fair information practices have fallen short of what is needed to protect consumers." In other words, consumers have little privacy protection on the Net.

For the past three years the Federal Trade Commission (FTC) has been examining the personal privacy and consumer protection issues raised by the collection and use of information about online consumers. Throughout this period, the FTC has maintained that industry self-regulation is the preferred approach for protecting consumer privacy online, basing its position on the belief that in the changing environment of the Web, the online industry can adapt its practices more quickly without government sponsored regulations.

According to David Medine, FTC Associate Director for Credit Practices, consumers have less confidence in the way online service providers and merchants handle personal information then they have in offline institutions, such as hospitals and banks. The result of inadequate or insufficient privacy protections is that people will simply not bring their business into the digital marketplace.

E-Commerce, Privacy, And The FTC

The FTC was established to "promote the efficient functioning of the marketplace by protecting consumers from unfair or deceptive acts or practices and increasing consumer choice by promoting vigorous competition." While regulations specifically governing Internet commerce do not currently exist, e-commerce does fall within the broad scope of the FTC's mandate.

The digital economy's rapid growth is one of the defining characteristics of the mid-1990s. The Web, in particular, offers easy access to goods, services, and information that can be delivered instantaneously to your computer or overnight on your doorstep.

At the same time new technologies have fostered the growth of e-commerce, they also offer new ways to collect and use information about individuals online. This is not simply the information that a Web site or online business requests, such as name, address, occupation, and social security number, but a detailed record of your activities online—your browsing patterns (both of products and on Web sites), the goods you purchase, and even comments you post in online discussion forums—all unbeknownst to you. Once personal information is collected to complete a transaction or as part of a registration process, a company may decide to use it for additional marketing purposes or sell it to another company for uses completely unrelated to the original purpose the information was exchanged.

The Status Of Information Practices

As background for this report, the FTC solicited and received nine industry-specific guidelines concerning online privacy from the Direct Marketing Association, The Bankers Industry Secretariat, Electronic Messaging Association, Interactive Services Association, Magazine Publishers of America, Council of Better Business Bureaus, and the National Association of Federal Credit Unions.

The FTC found that the guidelines generally "encouraged companies to provide notice of at least some of their information practices, and most encourage choice with respect to the disclosure of personal information to third parties." However, most of the guidelines do not address access or security, or provide for enforcement mechanisms. In addition, there is rarely an enforcement mechanism to ensure widespread adoption of online privacy guidelines.

Next, the FTC Report outlined a set of five widely accepted principles of privacy protection seen as essential to ensure that the collection, use, and dissemination of personal information

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SSL Secure Server Support[4]	YES	YES	YES
CyberCash™ Support[5]	YES	YES	YES

Technical Footnotes: **1.** All plans have a one time setup fee of $25. All accounts also require a domain name registration fee of $50. InterNIC (the governing agency in the U.S.) will charge a registration fee of $70 for your domain name, keeping it in force for 2 years. Thereafter InterNIC will bill you $35/year for your domain name. **2.** Additional data transfer is billed at $5/100MB per month. **3.** Additional disk space is available in blocks of 5 MB for $5/month. **4.** Secure Server Support has a one time setup fee of $25. Registration with a Certificate Authority like VeriSign is also required. VeriSign charges $395 for setup and 1 year use of a secure key; $295 for subsequent years. **5.** CyberCash Support has a one time setup fee of $25.

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are performed fairly and in a manner consistent with privacy interests of online consumers: notice, choice, access, security, and enforcement.

• Consumers should be given notice of an organization's information policies and practices before any personal information is collected from them. Without notice, consumers cannot make an informed decision before disclosing personal information.

• Choice addresses the secondary use of information beyond those necessary to complete a particular transaction. Secondary uses range from receiving additional marketing information from that company to the transfer or sale of your information to third parties.

• Access refers to individuals' ability to access data about them and to contest the accuracy and completeness of that information.

• Security involves both managerial and technical measures to protect against loss and the unauthorized access or use of the data.

• Privacy protection policies can only be effective and foster trust if there is an enforcement and redress mechanism in place.

The Findings Online

With these information privacy principles and industry guidelines as background, the FTC surveyed 1400 commercial US-based Web sites in March 1998. The sample was divided into six categories: (1) commercial sites likely to be of interest to consumers; (2) health sites; (3) retail sites; (4) financial sites; (5) commercial sites primarily directed at children aged fifteen and younger; and (6) popular commercial sites. The report found:

"Industry's efforts to encourage voluntary adoption of the most basic fair information practices have fallen short of what is needed to protect consumers."

• **Commercial Web Sites:** 92% of these sites collect personal information. Only 14% provide any notice of their information practices and only 2% have a comprehensive privacy policy.

• **Health:** 88% collect personal information while only 14% disclose their information practices.

• **Retail:** 87% collect personal information while only 13% disclose their information practices.

• **Financial:** 97% collect personal information while only 16% disclose their information practices.

• **Children's Sites:** 89% of these sites in the survey collect personal information from children while only 14% provide some form of disclosure of their information practices. In addition, only 23% tell children to seek parental permission before they provide information to the site.

• **Popular Commercial Sites**: 97% collect personal information. 71% of all the sites in this category have some type of information practice disclosure and 73% of the sites that collect personal information have such a disclosure.

Several interesting points are absent from the statistical results or the Executive Summary of the Report.

For this survey, any Web site that collected email addresses—the overwhelming majority—was categorized as collecting personal information. Most people are probably significantly less

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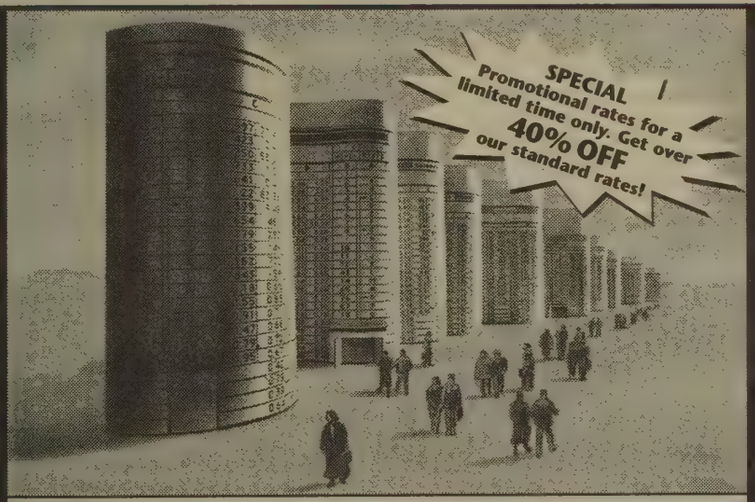

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worried by Web sites recording their email address than information such as one's mailing address, phone number, income, or Social Security number.

A full reading of the Report shows that the percentages of sites collecting at least one other type of personal information falls to 66% (still relatively high). The percentages also shift when counting information other than email addresses. For example, 68% of the sites collected names and 54% phone numbers, but only 26% collected fax numbers, 8% age, and 5% income levels.

The other observation easily missed in the Report concerns the higher disclosure rate found in the "Popular Commercial Sites." The higher rates may be partly attributable to these companies greater awareness of online privacy issues. A more likely cause is the fact that, of all the sites the FTC surveyed, only companies in this category were on notice that their sites would be examined.

Perhaps the better question here is not "Why do they have higher disclosure rates?" Rather, we should be asking, "Why did over one-quarter of the sites still fail to post an information practice disclosure when they knew the government would be examining their site?"

Next Steps

The Web provides an expanding range of opportunities for new and existing businesses to offer and deliver goods and services. While businesses have always sought to gather information from individuals to complete transactions, or in hopes of offering additional services, the Internet allows for the efficient, inexpensive collection of a vast amount of infor-

AOL's Eight Privacy Principles

Following the release of the FTC's *Report to Congress on Privacy Online*, industry organizations as well as individual companies have launched renewed efforts to develop online privacy guidelines and to implement self-regulation.

One June 22, for example, AOL CEO Steve Case announced AOL's *Eight Privacy Principles*, upon which its strengthened privacy policy is based. As the biggest Internet consumer access and services provider, Case said, "To build a global interactive medium that is as central to people's lives as the television or telephone, we will first have to win the full trust and confidence of consumers that their private information will stay private."

In addition, AOL is encouraging all companies who do any business with AOL on the Web to post their own privacy policies.

Privacy Principles:

1. We do not read your private online communications.
2. We do not use any information about where you personally go on AOL or the Web, and we do not give it out to others.
3. We do not give out your telephone number, credit card information or screen names, unless you authorize us to do so. And we give you the opportunity to correct your personal contact and billing information at any time.
4. We may use information about the kinds of products you buy from AOL to make other marketing offers to you, unless you tell us not to. We do not give out this purchase data to others.
5. We give you choices about how AOL uses your personal information.
6. We take extra steps to protect the safety and privacy of children.
7. We use secure technology, privacy protection controls and restrictions on employee access in order to safeguard your personal information.
8. We will keep you informed, clearly and prominently, about what we do with your personal information, and we will advise you if we change our policy.

—*Michael Robin*

mation from and about consumers as well as the greater analysis of this information. It is the ease and lower cost of collecting information that distinguishes the e-commerce from traditional business activities and information collection, and thus raises consumer concerns regarding privacy protection.

The federal government, largely through the Federal Trade Commission, has limited authority over the collection and use of personal information gathered online. The FTC is authorized to seek "injunctive and other equitable relief, including redress," for unfair and deceptive business practices. However, the FTC cannot require businesses to adopt information practice policies.

After three years of supporting industry self-regulation to address consumers' privacy concerns, the FTC's Report to Congress shows that the online industry has not established an effective self-regulatory system. The Report states:

"The vast majority of online businesses have yet to adopt even the most fundamental fair information practices (notice). Moreover, the trade association guidelines submitted to the Commission do not reflect acceptance of the basic fair information practice principles."

Given the findings that the majority of commercial Web sites do not notify individuals of their information practices and policies, and the absence of adequate industry guidelines, the Report asks "what additional incentives are required in order to encourage effective self-regulatory efforts by industry?" Later this summer, the FTC is expected to make recommendations on actions to protect online consumers. ◆

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FTC's How To Protect Your Privacy Web Site

The FTC has created a new "How To Protect Your Privacy" Web site (*www.ftc.gov/privacy/index.html*). Organizations to which you provide information—companies, marketers, the government—may use information about you for more than the specific task it was collected. They may use it to inform you of additional products and services, or they may share your information with others. In the traditional, offline business world, more organizations are beginning to offer people choices about how their information is used.

This FTC Web sites is a valuable resource for learning more about the choices you have to protect your personal information and how to contact credit bureaus, Departments of Motor Vehicles, and direct marketers to opt-out (request to be excluded) from various marketing campaigns.

• **Credit Bureaus:** the three major credit bureaus (Equifax, Experian, and Trans Union) have different requirements on how to opt-out. This site provides links directly to the privacy policy statements of these credit bureaus as well as sample opt-out letters to request that your personal information not be used for promotional purposes or shared with others.

• **Department of Motor Vehicles:** A new federal law gives you privacy rights with regard to information maintained by DMVs. The law lists the ways this information can be used—i.e., shared with law enforcement, insurance underwriting, etc. But it gives you the right to opt-out of having the DMV distribute your personal information for other types of uses, such as direct marketing.

• **Direct Marketers:** The Direct Marketing Association (DMA) offers the Mail and Telephone Preference Services, which allow you to opt-out of direct marketing and/or telemarketing from member companies. The DMA's Web address and physical address are provided, as well as opt-out forms that can be downloaded and mailed to the DMA.

—Michael Robin

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Free Email On The Web

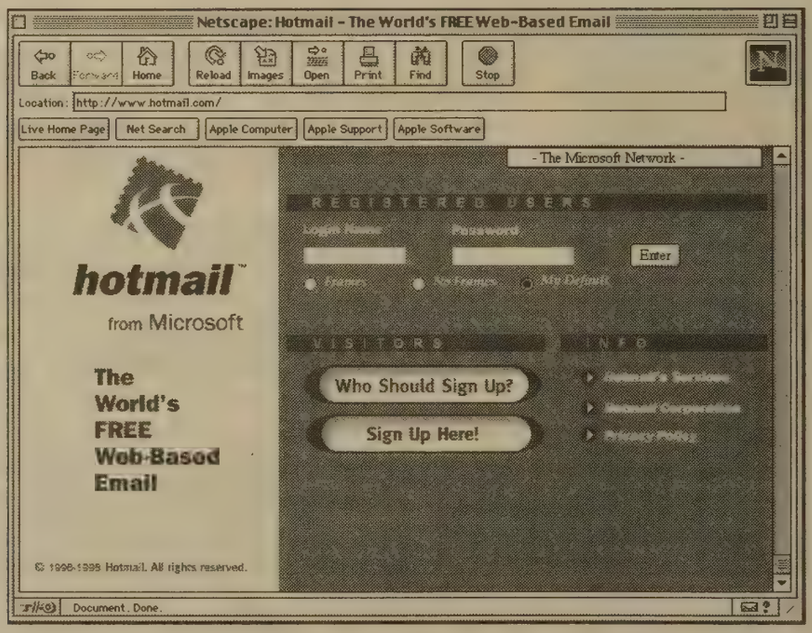
A Bargain At Twice The Price!

By Kevin M. Savetz

The big boys like Yahoo, HotMail, and GeoCities are tried and true, but there's nothing wrong with using any of the smaller services—as long as they're reliable, protect your privacy, and provide the services you need.

Those of us with electronic mail know just what a wonderful tool it can be. The Net is home to numerous free services that can make a good thing even better: by providing you with an elegant email address, multiple mailboxes, increased privacy, and easy access to your mail from any computer on the Internet. For people with access to the Net but no email address, these services can mean the difference between life with mail and life without.

There are many different free email services on the Internet: perhaps a dozen or so "big name" ones such as HotMail, Yahoo Mail, and GeoCities, plus countless smaller services. The big boys are



tried and true, but there's nothing wrong with using any of the smaller services—as long as they're reliable, protect your privacy, and provide the services you need.

Service Types

There are three distinct ways that these services can get your email to you: using a Web interface, with a POP account, or via mail forwarding. Some services offer just one of these delivery options; some offer all three.

With a Web interface, you can read and send email using your trusty Web browser. To use this type of system, all you need is access to a browser: the service provides a Web interface that lets you read and send mail. This is very flexible: you can access your email from anywhere you can log in to the Internet. It doesn't require an email address at your ISP—but if you do have one, remember that your Web-based mail account is totally separate from your ISP mail. This makes Web-based mail useful in a number of situations: you can keep personal email off of the servers at your workplace; you can create multiple accounts for your kids so they stay out of your mail; or you might create a mailbox just for your mailing list subscriptions.

Another type of email account is the POP account. POP, which stands for Post Office Protocol, allows you to receive email using just about any standard email program, such as Eudora or Outlook Express, or even with one of those cool palm-held computers. Like the Web interface option, POP mail doesn't require you to have another email address, but it does mean you have to install an email client on your computer. And like the Web interface option, POP accounts provide a measure of privacy.

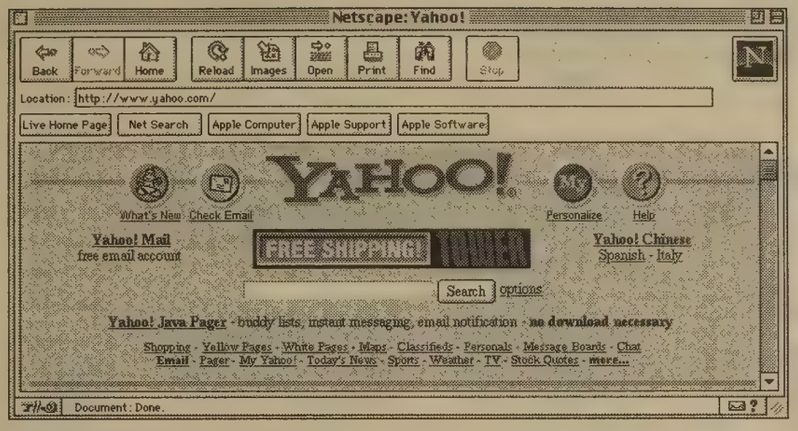
Power users will find that using an email client provides more features than doing email through a Web interface can—but with POP, it's not as simple to check your mail from just anywhere.

The final type of free email account is mail forwarding. Mail forwarding services only work if you already have an email address. Forwarding gives you a new email address that, when you receive a message, punts it to your other address. Why would you want to do this? Because *bob@iname.com* is a whole lot easier to remember (and prettier on your business card) than *74774.2725@compuserve.com* .

Also, mail forwarding provides a modicum of privacy: have your John Tesh fan club mail sent to an address that doesn't reveal your identity to other subscribers.

Mail forwarding services let you receive mail at a special address, but don't necessarily allow you to send it from that address (some services do provide a Web interface for that).

Which type of account is best for you? If you already have email but hate your address, mail forwarding is an easy solution. If you don't have email at all, or want additional mailboxes, go with Web-based mail or a POP account. Web-based mail is simpler and accessible from any Web browser, but POP mail can be sweeter for power users.



For people with access to the Net but no email address, these services can mean the difference between life with mail and life without.

Finding A Service

How do you find a free mail service? Point your web browser to one of these indices.

The Free Email Address Directory (*www.emailaddresses.com*) is a well-organized index of dozens of them, sorted by the type of service: Web-based mail, POP and forwarding. In addition, it lists a myriad of services that work in languages other than English.

Another fantastic index is The Guide to Free Email Accounts (*www.geocities.com/SiliconValley/Vista/8015/free.html*). It lists more than 200 services worldwide, and also sorts by the type of service.

For instant gratification, try one of these popular services:

HotMail (*www.hotmail.com*), Yahoo Mail (*http://mail.yahoo.com*) or ZDNET Mail (*www.zdnemail.com*).

You can get more bang for your buck (well, not even a buck—they're free!) with GeoCities, which offers Web page space along with email (*www.geocities.com*); and My DejaNews, which offers a nifty Usenet reader plus Web-based mail (*www.dejanews.com/rg_reg.xp*). ◆

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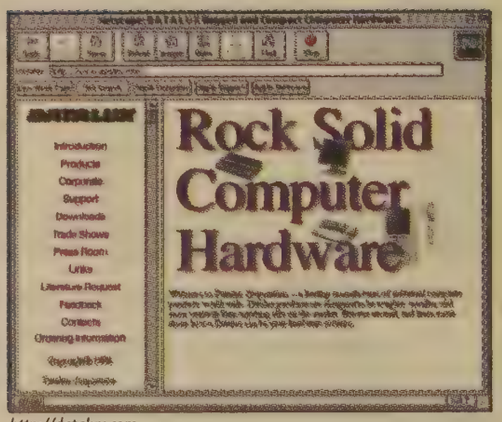

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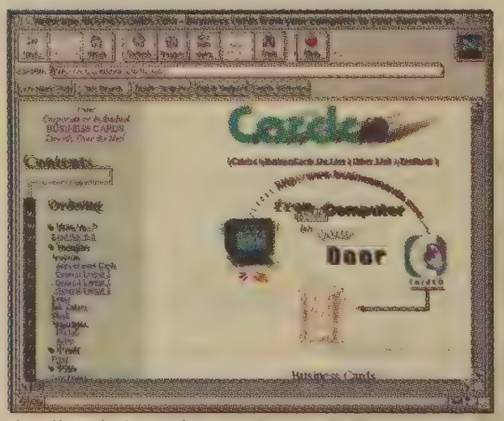

http://www.businesscards.com

http://www.rrhassociates.com/

Computer Products & Services

Aesthetic Solutions *http://www.aesthetic.com* Create dynamic 3D worlds in minutes using our virtual reality authoring tools—free demo available! [Exp. #182.]

Computer System Solutions *http://www.comput.com* IBM-compatible systems. High-quality, competitive prices. Warranty and support included. Since 1989. [Exp. #181.]

Datalux Corporation *http://datalux.com* Rugged and compact computer hardware. [Exp. #183.]

Digital Auction *http://www.digital-auction.com* A new online auction for PC systems, hardware, and computer upgrades. [Exp. #181.]

Disk-Go-Tech Computers *http://www.disk-go-tech.com/* A computer store. [Exp. #183.]

ExecUtron Development Corp. *http://www.executron.com/* Developers of inventory control, POS, and accounting software. [Exp. #183.]

Follgard Group Inc. *http://www.follgard.com/* A hi-tech, multimedia, communications, and marketing company, specializing in CD-ROM, Web site, e-commerce, telephony, and software development. [Exp. #181.]

JC Enterprises *http://www.jcenter.com/* Business computers and related products. [Exp. #182.]

MacShareware.com *http://www.macshareware.com/* The site currently hosts shareware games and commercial demos. A complete custom database is being built to host the complete realm of Macintosh shareware. [Exp. #182.]

Match Software Fonts *http://www.matchfonts.com* Online font catalog for Windows, Mac, and OS/2. [Exp. #181.]

Mind Of The Machine *http://www.mindofmachine.com/* Custom software company. [Exp. #182.]

Polaris PackRat Professional *http://www.polarissoftware.com* A powerful, customizable desktop information management system. [Exp. #181.]

Scitec Laboratory Automation *http://www.scitec-automation.ch/* Robotics automation, laboratory devices, and scheduling software. [Exp. #183.]

Web/Internet Services

Absolute Magic Computers/Internet *http://www.absolutemagic.com* Affordable Web site design and maintenance, computer and network consulting. Ten years in Orange County. [Exp. #181.]

AlcanSeek *http://www.alcanseek.com* Search engine and directory of Alaska and Canada Web sites. [Exp. #183.]

Association Of Support Professionals *http://www.asponline.com* ASP announced the selection of the top ten Web-based customer support sites. [Exp. #182.]

Bannerhood *http://www.thebannerhood.com/* We create very clickable Web banners. [Exp. #183.]

Bargain Seeker *http://www.bargainseeker.com* A search engine for discount goods sold over the Internet. [Exp. #182.]

Birds Eye *http://www.birdseye.com* World's largest online recipe database. [Exp. #182.]

CatchTheWeb *http://www.catchtheweb.com* allows users to capture any Web page or series of Web pages, annotate and organize them, and arrange them into a presentation viewable in any JavaScript-capable browser. [Exp. #181.]

Cogetec Informatique Inc. *http://www.cogetec.com/* Web services, systems integration, and software consulting. [Exp. #183.]

CommTechs, Inc. *http://www.commtechs.com/* Computer, communications, and Internet consulting. [Exp. #183.]

Cuenet *http://www.cuenet.com* Listservs, email, WWW, domain hosting, site development, and complete outsourcing. [Exp. #181.]

DBServe *http://www.DBServe.net* Database, commerce, online transaction, and streaming media (RealAudio/Video, NetShow) hosting for corporate clients. [Exp. #182.]

The Editors Advertising Agency *http://www.theeditors.com/* 20-year old full service ad agency specializing in Web page design, advertising, marketing, graphic design, and print collateral. [Exp. #181.]

E. G. H. Corporation *http://www.eghcorporation.com* E-commerce catalogs, hosting, and Web site design. [Exp. #182.]

Globalynk Internet Solutions, Inc. *http://www.globalynk.com/* National Internet Service Provider. [Exp. #183.]

Home Business Network *http://www.hbn.com/* Offering services, business opportunities, and advice for computer/mail order professionals and others working from their home. [Exp. #182.]

I-Swift *http://members.aol.com/Iswift2* Web design and development. [Exp. #183.]

Internet Traffic Report *http://www.internettrafficreport.com* A Web site that tracks Internet traffic in real-time. [Exp. #182.]

IT Network *http://www.itnetwork.co.uk/* Internet TV and multimedia data storage information service. [Exp. #181.]

PeachPod *http://www.peachpod.com/* The Internet just for kids. [Exp. #183.]

SinaSearch *http://www.sinanet.com* The world's first complete Chinese/English search engine. [Exp. #181.]

Siris.com *http://www.siris.com/* Multimedia, communication, and Web design. [Exp. #181.]

Surfaway *http://surfaway.com/* Internet services, marketing, and Web hosting. [Exp. #183.]

The-Best-Of.com *http://www.the-best-of.com* Users can vote for your business and win prizes. Business Web pages for $15/month. [Exp. #181.]

uBid Online Auction *http://www.ubid.com* Selling over 10,000 items each month. [Exp. #183.]

WebZinger *http://www.webzinger.com/* The easiest way to find what you want on the Web. [Exp. #183.]

Services & Products For Sale

100% Made In Italy *http://www.collezioni.it* Handcrafted articles produced in Italy. I nostri articoli sono prodotti completamente in Italia nel me. [Exp. #182.]

Advanced Bearings And Belts *http://advancedbearing.com/* An international firm specializing in sales and service of industrial bearings, belts, pumps, compressors, and hoses. [Exp. #182.]

Adventure Publishing *http://www.adventurepublishing.com/* Business-to-business marketing. [Exp. #183.]

American Car Buying Service *http://209.50.96.85/home_rrk.html* Provides new auto pricing services over the Internet. [Exp. #181.]

Anne Schofield Jewelry Designs *http://home.earthlink.net/ ~asj/Index.html* Beautiful earrings assembled right here in California. Gold, silver, lightweight, affordable, plus a free newsletter. [Exp. #182.]

Auto-Insurance *http://insuranceman.com/* Auto insurance, church insurance, and business insurance. [Exp. #183.]

Bassett Consulting Group *http://www.bassettgroup.com/* Experts in the field of management development and consulting. [Exp. #183.]

Battery Doctor *http://www.batterydoctor.com* Reuse your old cell phone, laptop, or video camera Ni-Cad battery. [Exp. #182.]

Benton Aviation Inc. *http://www.bentonaviation.com/* Aircraft sales. [Exp. #183.]

Business Cards *http://www.businesscards.com* Business cards from your computer to your door! [Exp. #182.]

By Names And Images *http://www.bynamesandimages.com/* Graphics, animation, scanning, business services, and more. [Exp. #182.]

CD Source *http://www.cdsource.com/* The best price and largest selection. [Exp. #183.]

Champagne Products Home Page *http://www.thechampagneopener.com/* [Exp. #183.]

ComCoTec, Inc. *http://www.comcotec.com/* Pharmacy health care systems and services. [Exp. #181.]

Costello & Associates *http://www.costellonet.com/* Management consulting firm. [Exp. #181.]

Court Reporting *http://www.deposerve.com/* Recording of depositions and court trials. [Exp. #182.]

CSB-Marketing *http://www.csb-marketing.co.uk/* Promotional clothing specialists. [Exp. #183.]

Dockside Management *http://docksidecarib.com* Specializing in shore services for luxury yachts for the entire Caribbean. [Exp. #182.]

Dryer's Grand Ice Cream *http://www.dryers.com* Check out the only place you can get your fill of Dryer's ice cream—calorie free. [Exp. #182.]

Duncan's American Radio Web Site *http://www.duncanradio.com/* Radio research for inside the radio industry. [Exp. #181.]

Earthwise Animal Products *http://www.earthwiseanimal.com/* Holistic pet products. [Exp. #183.]

Enviro Waste Systems *http://www.envirowastesystems.com/* Waste and recycling solutions. [Exp. #182.]

Ethnic Apparel *http://www.helenzeke.net/* Irish Apparel, food, ethnic shirts, and novelties. [Exp. #181.]

Farmers Marine Copper Works, Inc. *http://www.farmersmarine.com/* Engineering consulting and manufacturing company. [Exp. #183.]

Hand Made Candles, Etc. *http://www.handmadecandles.com/* Triple scented candles. [Exp. #183.]

Hands Off! The Umbrella *http://www.handsoff.com* Manufacturer and distributor of specialty umbrellas. [Exp. #183.]

Honeywell Security *http://www.honeywell.com/fireandsecurity* Security solutions for home and business. [Exp. #183.]

HPV Systems *http://www.hpvsystems.com/* Air duct cleaning of every type, material, size, and form in the Netherlands and Belgium. [Exp. #181.]

HTBrown Consultancy *http://www.htbrownconsultancy.com/* Consulting in Government procurement policy and contract management, and business development. [Exp. #181.]

Impact Parts *http://www.impactparts.com/* Honda and Acura performance accessories. [Exp. #181.]

Index Braille Printer Company *http://www.braille.se/* [Exp. #182.]

INFOCOM Group *http://www.infocom.dk* Training, communication, simulation, and information systems. [Exp. #183.]

Jake's Dog House *http://www.jakesdoghouse.com* Large selection of unique products for dogs, including collars, leashes, treats, toys, and books. [Exp. #182.]

JDC's House Of CD-ROM *http://www.houseorom.com* A great place to buy or sell new or used CD-ROMs, video games, and more. [Exp. #182.]

Just Liners *http://www.justliners.com/* Fabricates, polyvinyl, chloride pond liners. [Exp. #182.]

Loadcells And Weighing Scales *http://www.massload.com* [Exp. #183.]

Lorraine Electronics Surveillance *http://www.cin.es/lorraine* Surveillance products manufacturer. [Exp. #183.]

M.B.A. Products Div. Of Mallory Industries, Inc. *http://www.mbaproducts.com/* Billet Aluminum automotive products for the GM platform, manufacturers of high-quality accessories for the LT1/LT4 engine in Camaro, Firebird, Impala SS, and Corvette. [Exp. #182.]

McCarl's Inc. *http://www.mccarl.com/* Mechanical contractor. [Exp. #182.]

Medical Bill Auditing Consulting Systems *http://www.mbacs.com/* [Exp. #181.]

Mystery Shop *http://www.interking.com/b/a/mysteryshop.html* Mystery customers needed. Reasonable pay. [Exp. #181.]

PAR Orthodontic Laboratory *http://www.parortho.com* Full service laboratory constructing high-quality, custom appliances for orthodontists nationwide. [Exp. #181.]

Prepress Services *http://www.accu-color.com/* Promoting our pre-press shop. [Exp. #181.]

The Robin's Nest Custom Em-broidery *http://www.therobinsnest.com/* The Web site offers our online catalog. [Exp. #182.]

RRH Associates *http://www.rrhassociates.com/* Electronic Architects. [Exp. #183.]

Smart Dolly—Bottled Water Installer *http://www.smartdolly.com* Roll the bottle onto cradle, Smart Dolly lifts and loads automatically. No lifting, no spills. [Exp. #181.]

Smith Corona For SOHO *http://www.smithcorona.com/* Smith Corona center for small office/home office business products. [Exp. #183.]

TechKnowledge Consulting *http://www.techknlg.com/* Telecommunications consulting firm focusing on voice, data, and video network design, project management, and technology planning. [Exp. #182.]

Time To Market, Inc. *http://www.timetomarket.com/* A team of professionals that develop and implement competitive sales strategies and measurable marketing programs for software companies. [Exp. #183.]

Tony Alexander *http://www.best.com/~alex20* Architect and computer graphics artist. [Exp. #182.]

Tripweb *http://www.tripweb.com* Online airline reservations, car rentals, hotel reservations, cruise lines, passport and visa info, Disney packages, and general travel information. [Exp. #181.]

The Twelfth House Metaphysical Store *http://www.thetwelfthhouse.com/* The best resource for New Age information. [Exp. #183.]

US Digital Communications Inc. *http://www.usdi.net/* Digital communications. [Exp. #182.]

Veterinary Specialist Network *http://www.veterinary.com/* VSN brings world renowned veterinary specialists together with private practitioners in a collaborative effort to enhance veterinary medical diagnosis. [Exp. #183.]

Via Data & Marketing Services *http://www.vianj.com/* Fulfillment, mailing, prospect management services. [Exp. #183.]

Washington Institute Of Dermatologic Laser Surgery *http://www.skinlaser.com/* The D.C. metropolitan area's first laser surgery center dedicated solely to the laser treatment of dermatologic conditions. [Exp. #182.]

World Auto Parts, Inc. *http://www.worldauto.com/* Supplier of automotive cores to the rebuilding industry. [Exp. #183.]

Writing Specialties Home Page *http://www.writingspecialties.com* Wholesale distributor of quality Sanford writing instruments. [Exp. #183.]

Financial/Real Estate Services

1% Homeseller *http://www.1homeseller.com* Discounted real estate fees, buyer rebates, homes for sale by owner in Southern California. [Exp. #181.]

Abacus International Financial Network *http://www.abacusintl.com/* [Exp. #182.]

American Capital Loans *http://www.debthelp.cc/* Providing loans for homeowners with no equity required. [Exp. #181.]

Bank Of San Francisco *http://banksf.com/* Private and business banking, stock option and discount brokerage services. [Exp. #183.]

Development Finance Limited *http://www.dflpos.com* [Exp. #182.]

Durban Roodepoort Deep Gold Mining Group *http://www.drd.co.za/* Information for investors, analysts, researchers and others. [Exp. #182.]

Fidelity Capital *http://www.fidelitycapital.com/* Fidelity Capital is the new business development and venture capital arm of Fidelity Investments. [Exp. #182.]

Fidelity Ventures: Venture Capital Investing *http://www.fidelityventures.com/* Helping to develop companies in healthcare, communications, software, employer services, and education. [Exp. #183.]

Flex-Soft *http://www.flex-soft.com/* Develop proposal and illustration software for pension & retirement planning industry. 401(k) software. [Exp. #183.]

Furstenfeld Group *http://www.parabroker.com/* National and international trade. [Exp. #183.]

HomeShark *http://www.homeshark.com/* The leading online mortgage and real estate services company. [Exp. #181.]

IOA Re *http://www.ioare.com/* A full service reinsurance underwriting manager specializing in the Accident and Health reinsurance and insurance fields. [Exp. #182.]

Jeremiah K. Murphy, CPA *http://www.jkmcpa.com/* Helping businesses succeed for over 20 years. [Exp. #182.]

KingFINE *http://www.kingfine.com* Online stock picking contest, active investment message board, and investor community. [Exp. #183.]

The McLean Group *http://www.mcleangroup.com/* Real estate developers. [Exp. #181.]

Northern California Real Estate *http://www.alolvera.com* Specializes on properties for the investor, in Contra Costa and Alameda counties. [Exp. #183.]

Pacific Coast Realty *http://www.buyersagentrealty.net/* Access to Sacramento, CA real estate. [Exp. #183.]

Rate.net *http://www.rate.net/* Mortgage, CD, auto, and credit card interest rates are ranked and compared daily for over 11,000 financial institutions at RateNet. [Exp. #183.]

Ronald J. Riley's Internet Pages *http://www.rjriley.com/* Investor resources. [Exp. #182.]

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PPP Account
FREE Support
Internet Explorer
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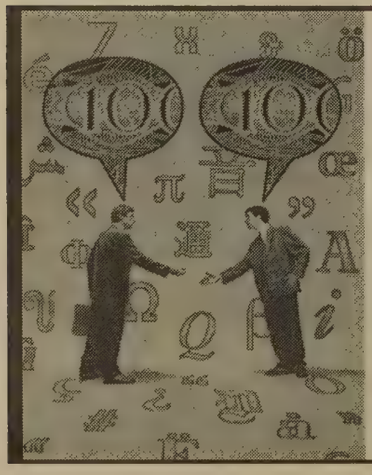

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Stockholder.com *http://stockholder.com/* The number one investor forum with message boards and investor relations info. [Exp. #183.]

Technology Funding Capital Fund VI *http://www.techfunding.com* The first public security to be registered nationwide as an online offering and the first venture capital investment opportunity offered to small investors over the Web. [Exp. #182.]

Tulips And Bears *http://www.toddswitzer.com/* Free market newsletter provides contrary opinion for thinking traders. Global coverage, both long and short. [Exp. #183.]

Employment/ Education

Black American History *http://www.neuronet.pitt.edu/~earl* [Exp. #183.]

DiversiLink *http://www.diversilink.com/* The official career development and job posting Web site of the Society of Hispanic Professional Engineers (SHPE). [Exp. #183.]

Fundamental Buddhism Explained *http://www.fundamentalbuddhism.com/* Explicit explanation of Buddhism, based on the Pali Canon, recognized by Buddhist scholars as the oldest surviving written record of what the Buddha actually said and taught. [Exp. #182.]

Historic American Productions Web Site *http://www.cyberramp.net/~hap/* Pioneer skills educational video series. [Exp. #182.]

Latin America And Caribbean Jobs Page *http://www.visa.com/careers/* Career opportunities at VISA Latin American/ Caribbean headquarters located in Miami, FL. [Exp. #183.]

Leslie H. Carter & Associates *http://members.aol.com/SU4MLK/index.html* Youth violence prevention and intervention programs designed to teach students social responsibility, citizenship, and skills to resolve interpersonal conflicts. See examples of curriculum. [Exp. #182.]

Mr. Brain Tutor *http://members.tripod.com/~russmccor/tutor.htm* Live teachers online: Tutoring in mathematics, English, computer programming, history, writing, etc. [Exp. #181.]

New Job Site *http://www.nethunter.net* [Exp. #181.]

Precision Screening *http://www.precisescreen.com/* Advanced, affordable pre-employment screening solutions. [Exp. #183.]

Pro Web Resumes *http://www.prowebres.com/* Your one page resume converted into a custom designed Web resume site that will set you apart from your job competition. [Exp. #183.]

Southwest Safari *http://www.southwestsafari.com/* Educational adventure travel in the southwest. [Exp. #183.]

Teach Your Child To Swim With Aqua Tykes *http://www.aquatykes.com/* Teach your child to swim with ease and confidence! [Exp. #181.]

Organizations

Arizona Environmental Health Association *http://www.aeha.org/* Non-profit association for the advancement of environmental health in Arizona. [Exp. #182.]

Better Golf Institute *http://www.bettergolf.org/* [Exp. #183.]

Condo Management Online *http://www.condomgmt.com/* The premier resource for community associations. [Exp. #181.]

Cyber Home of Judaism *http://www.ou.org/* A one-stop resource for everything Jewish and Israel related. [Exp. #183.]

East Long Beach Jr. Baseball '98 *http://www.elbjb.org/* Includes up-to-date scores, standings, schedules, team rosters and photos, plus much, much more. [Exp. #183.]

The Fourth Freedom Forum *http://www.fourthfreedom.org/* Specialists in sanctions, incentives, and nuclear nonproliferation. [Exp. #183.]

Golden Gate Computer Society (GGCS) *http://www.ggcs.org* Membership and activities information about a premier microcomoputer group. [Exp. #183.]

Hepatitis C: An Epidemic For Anyone *http://www.epidemic.org/* This health awareness site, hosted by Dr. C. Everett Koop, provides extensive information about the hepatitis C epidemic. [Exp. #183.]

Institution of Incorporated Engineers *http://www.iie.org.uk/iie* The UK's largest professional association in electronic, electrical, and mechanical engineering for incorporated engineers and engineering technicians. [Exp. #181.]

KidsHealth Club *http://www.ama-assn.org/KHClub* The purpose of the American Medical Association's (AMA) new KidsHealth Club is to help parents raise healthy, happy children. [Exp. #182.]

Main Street United Methodist Church *http://www.jfsi.com/msumc.htm* Kernersville, NC's friendliest and most vibrant Church. [Exp. #181.]

National Center For Employee Ownership *http://www.nceo.org/* Articles, columns, discussions, and interactive training on employee stock ownership plans, stock options, etc. [Exp. #182.]

Neighbors For Responsible Logging *http://www.responsible-neighbors.org* A grassroots environmental group. [Exp. #182.]

Performance Animation Society *http://www.PASociety.org* 3D character and performance animation/motion capture SIG. [Exp. #181.]

United States Amateur Ballroom Dancers Association *http://www.usabda.org/* [Exp. #183.]

Publications

Best Telephone Directories Inc. *http://www.bestdirectories.com/* Philippine Yellow Pages publisher and software company. [Exp. #183.]

Car Secrets *http://www.igs.net/carsecrets/info12.htm* An auto consumer's and owner's book for sale online with hundreds of cost saving tips. [Exp. #181.]

Cookbook Marketplace *http://www.pemcoltd.com/* Over 1,500 cookbook titles are indexed and available for review and purchase online. That is every title in print! [Exp. #182.]

dailylung.com *http://dailylung.com/* A magazine for Pulmonary Medicine physicians, patients with lung disease, and their families. [Exp. #182.]

Driving And Style *http://www.drivingandstyle.com/index.html* Online e-zine that includes information for auto enthusiasts. [Exp. #182.]

Echo Station *http://www.echostation.com/* Online magazine for Star Wars fans with the latest news, reviews, previews, and interviews from the Star Wars universe. [Exp. #182.]

Financing News *http://www.datamerge.com/financingnews/index.html* The Financing News Online Edition has been completely revamped with many new articles and a user friendly interface. [Exp. #182.]

Football 365 *http://www.football365.co.uk/* The world's only free, daily, personalized soccer newspaper. [Exp. #183.]

Fragments Of A Lost Mind *http://www.enteract.com/~duh/index.htm* A great American novel. [Exp. #182.]

Global Phone Book *http://www.PhoneNumbers.net* Offers a unique collection of phone, fax, and email directories—worldwide. [Exp. #181.]

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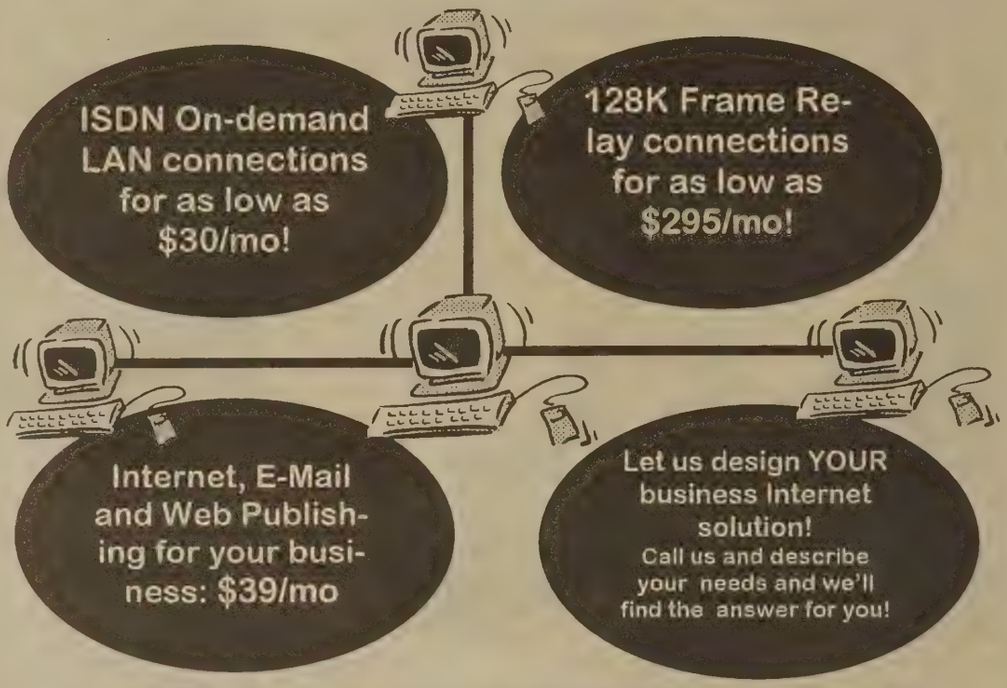
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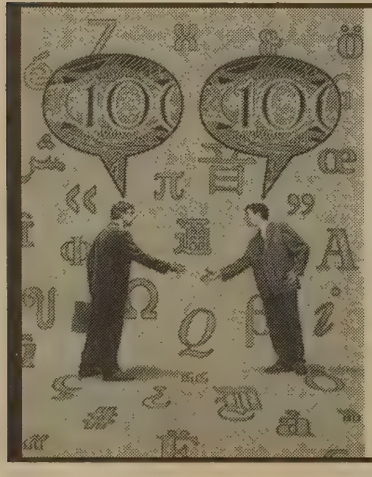

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ModemHelp.com *http://www.modemhelp.com* ModemHelp is an infocenter type resource which offers a complete guide to modem-related information on the Web. [Exp. #181.]

Russian Internet Broadcasting *http://www.ribcast.com* Russian newspapers are now available via Backweb push channels in Acrobat PDF format, including all graphics and Russian fonts. [Exp. #182.]

Soccer 365 *http://www.soccer365.com/* A free daily, fully personalized soccer newspaper. [Exp. #182.]

Tips On How To Improve Your Golf Game *http://www.nwgraphics.com/golf* A booklet to show you how you can improve your golf game. [Exp. #182.]

U-Turn Monograph And E-zine *http://www.uturn.org/* An art journal. [Exp. #181.]

Government/ Politics

Alberta (Canada) Strike Solidarity Page *http://www.geocities.com/CapitolHill/5202/cargill.html* Get updated labor news. Check out our campaign for anti-scab legislation. [Exp. #182.]

Democracy Direct *http://www.marinternet.com/rknox/car15.html* Reclaiming democratic representative government by giving the national and state electorates a meaningful and direct voice (not the last word) in state and national government. [Exp. #181.]

May Day On the Web 1998 *http://www.accessweb.com/mayday/* Workers fight for human rights. [Exp. #181.]

Arts

American Photographer In Spain *http://www.geocities.com/Soho/Gallery/5718/feria.html* Images of The Spring Fair (La Feria) in Spain! [Exp. #181.]

Art-Smart *http://www.art-smart.com* An easy method for an artist or gallery to showcase their artwork in a fully searchable database of art on the Web. [Exp. #182.]

ArtsLink Australia *http://www.artslink.org.au/* Professional performing and entertainment site. [Exp. #181.]

Artuframe *http://www.artuframe.com/* The world's largest online art and framing gallery featuring discounted artworks, mats, framing services, and other art-related products. [Exp. #182.]

Cannonball Express *http://www.best.com/~canonbal* A video project-in-progress about urban firestorms, fire safety and environmental issues. [Exp. #182.]

The Lodge *http://www.thelodge.com/* A cyber-retreat for authors, artists, and creative businesses. [Exp. #183.]

Mid-Atlantic Center For The Arts *http://www.capemaymac.org* In Cape May, NJ. Year-round activities to delight visitors of all ages. [Exp. #183.]

Mildrey Guillot *http://www.mildreyguillot.com/* Cuban artist Mildrey Guillot's personal online exhibit. [Exp. #183.]

One Art World *http://www.oneartworld.com* A free Web-based art gallery exhibiting artworks by contemporary, distinguishing artists. [Exp. #181.]

PaintingsDirect.com *http://www.paintingsdirect.com/* A new way to find and buy paintings. [Exp. #181.]

Peter Findlay Gallery *http://www.findlay.com/* Art gallery. [Exp. #181.]

Rising Stars *http://www.kodak.com/go/motion* This Web newsletter of the Kodak Wold-wide Emerging Filmmaker Program is part of a broader initiative designed to provide practical support for people at the beginning of their careers. [Exp. #183.]

Ted Alvy Cosmos Topper Home Page *http://pages.prodigy.com/FNJD74A* Art of '60s L.A. underground radio, rebop, beatniks, hipsters, hippies, zoot horn rollo. [Exp. #183.]

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w/Sound Blaster 16 . . . . . $134
w/Sound Blaster AWE64 . . . . . $164

MULTIMEDIA
32X Speed Mitsumi IDE CD-ROM Drive $79
60 Watt Speakers, Magnetically Shielded $19

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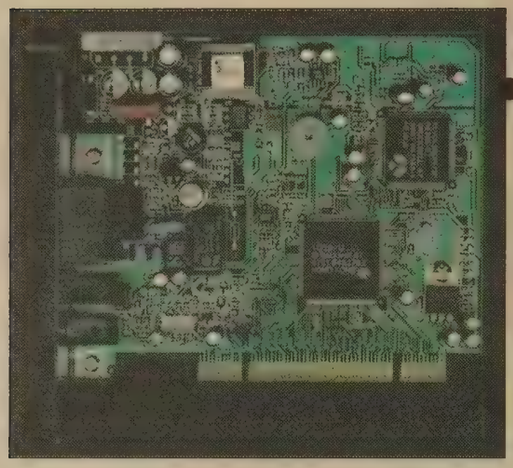
Product Announcements



PC Hardware

CyberBullet PCI 56RVP Modem

This PCI bus-based 56K modem will provide high-speed Internet access and full voice and fax capabilities. It is Windows 95/98- and Windows NT-compliant. It also has ASVD/DSVD functionality and supports ITU-T standards, including the new V.90 standard, which maximizes compatibility for 56K modem connections. CyberBullet is also backwardly compatible, and supports older standards such as V.34 to allow the highest possible data speeds when connected to older modems. This plug-and-play modem installs into any 32-bit PCI bus expansion slot. It provides 33MHz PCI clock support, which adheres to the new Intel architecture design initiatives and ensures future compatibility with next generation PCs. Full duplex, speakerphone and a broad range of voice features gives users complete video conferencing capabilities. Built-in V.80 technology provides videophone capability for PC's equipped with a video camera and sound card. (Estimated street price, $99) E-Tech Research, Inc. 47400 Seabridge Dr., Fremont, CA 94538. (510)438-6700, *www.e-tech.com* .

CONTACT Handheld PC

This Microsoft Windows CE 2.0 handheld PC includes a wireless modem, providing access to email, the Internet, and corporate information systems. It comes equipped with Microsoft Word, Excel, PowerPoint, Internet Explorer, email inbox, and a host of PIM applications. Weighing less than 22oz., it offers an array of communications features, including: a full QWERTY-style keypad, serial/VGA port, type II PC card slot, infrared port, integrated 19.2 kbps wireless modem, 14.4 kbps wireline/9.6 kbps fax modem, 640 x 240 LCD display with backlighting, and integrated microphone/speaker for memo recording. It also features custom Windows CE applications that guide the user through the wireless subscription process and facilitates the modem configuration and operation. ($1000 plus activation) CONTACT is available from Mobile Planet, 1-800-MPLANET or *www.mplanet.com* . Novatel Wireless, Inc. *www.novatelwireless.com* or 1-888-888-9231.

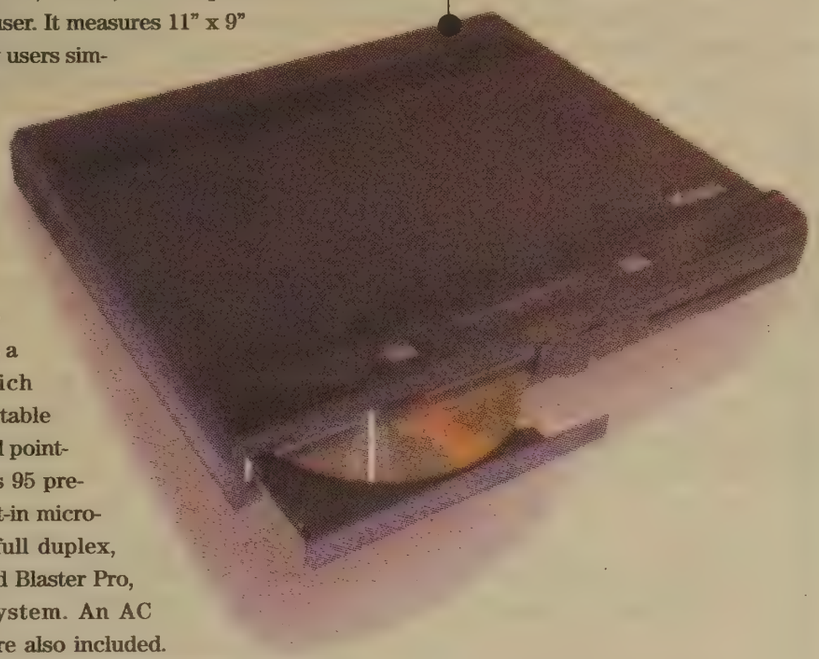
UT Oncore GPS

This is a complete GPS receiver and antenna integrated into a single package. UT Oncore is intended for use in harsh environments and will output a serial data stream and a highly accurate one-pulse-per-second signal (with Time RAIM—Time Receiver Autonomous Integrity Monitoring) for use in the precision timing and frequency industry. By combining the receiver and antenna in a single weatherproof housing, the remote receiver eliminates RF signal-loss problems and the need for expensive coaxial cable runs from towers or rooftops. Instead, a low-cost, twisted-pair data cable connects the timing device to its host system. The combination of Motorola's UT Oncore GPS receiver technology and rugged packaging provide an easy-to-install and cost-effective solution for precision timing and frequency devices used in telecommunications infrastructure, computer networking, and other timing applications. The UT Oncore is capable of tracking eight satellites simultaneously, which typically is the maximum number of satellites in view at any given time. Motorola's GPS Products, 1-888-298-5217. *www.oncore.motorola.com* .

Notebook Hardware

OpenNote 786 Convertible PC

This new family of small footprint 166-266MHz desktop computers can easily be converted to a notebook PC. The new systems look like a standard notebook computer without a keyboard, screen, or touchpad—all of which can be added when needed by the user. It measures 11" x 9" x 2", weighs just 4lbs, and will allow users simply to hook up their monitors and keyboards to the Kiwi portable desktop either through standard cables or an optional port replicator. When users require a more mobile solution they can convert the desktop unit to a high-performance notebook PC. Kiwi Computer offers a "convertible upgrade kit," which includes an active-matrix TFT portable display and keyboard with touchpad pointing device. It comes with Windows 95 preloaded. Audio features include built-in microphone and stereo speakers; and full duplex, 16-bit audio, compatible with Sound Blaster Pro, Ad Lib, and Windows Sound System. An AC adapter, and Lithium-Ion battery are also included. Kiwi notebooks feature an upgradable, open architecture that uses a host of standard components such as a ZIF socket upgradable CPU; standard low-cost 144 pin SODIMMs; and upgradable standard hard drives. ($950) Kiwi Computer Inc., 2388 Walsh Ave., Santa Clara. (408)492-9188, *www.kiwicom.com* .



EZ-Gig Data Transfer Utility Kit

A one-click, do-it-yourself hard drive upgrade for notebook computers, the EZ-Gig Data Transfer Utility Kit can transfer the entire contents of a hard drive to a larger-capacity drive without altering any data or settings in one easy step. After the new drive is installed, the system boots exactly as before—no reinstallation or reconfiguration is necessary. By using it you can upgrade the hard drive on a notebook computer in minutes. It provides a direct connection to a new, larger-capacity hard drive through a PC Card interface and proprietary utility software. The upgrade kit comes with Data Transfer Utility Software, an ATA PC Card and cable assembly, and the appropriate high-capacity hard drive in 1.4GB, 2.1GB or 3.1GB sizes. It supports most major operating systems and has been successfully tested for compatibility with most notebooks. The EZ-GIG hard drives are backed by a three-year warranty, and the cable assembly by a lifetime warranty. Toll-free technical support is available. (Prices begin at $429, and vary according to drive size and portable manufacturer and model.) Apricorn at 1-800-458-5448, (619)513-2000, or *www.apricorn.com* .

Updates

Adobe Systems Inc. introduced new converter software for Microsoft Publisher files to allow publishers to easily move up to PageMaker 6.5, and take advantage of its desktop publishing capabilities. Free download at *www.adobe.com/prodindex/pagemaker/main.html* , or call 1-800-422-3623.

Artisoft Communications Software Group shipped **i.Share 3.0**, the software that enables up to 32 networked PC users to browse different Web sites at the same time via one connection. (Starts at $129 for the three-user version) Artisoft Communications Software Group, (520)670-7100. *www.artisoft.com* .

BEI Corp. released **Ultrabac for NT 5.0** a year 2000 compliant backup program for Microsoft's Windows NT. It is used in thousands of Windows NT networks worldwide protecting mission critical data. ($149 for personal edition; $1,295 for the Enterprise Edition) BEI Corp., (425)644-6000, or visit *www.ultrabac.com* .

CDW Computer Centers announced that its e-commerce Web site, www.cdw.com , now boasts automatic price and availability alerts, more product comparisons and advanced searching to help online shoppers sort through computer products. CDW Computer Centers, (847)465-6000, 1-800-797-4239 or, *www.cdw.com* .

Elemental Software released **Drumbeat 2.0**, that requires no programming or coding of any kind when developing sites that search and update databases in real time and generate custom pages on-the-fly. ($699) Elemental Software *www.drumbeat.com* or 1-877-DRUMBEAT.

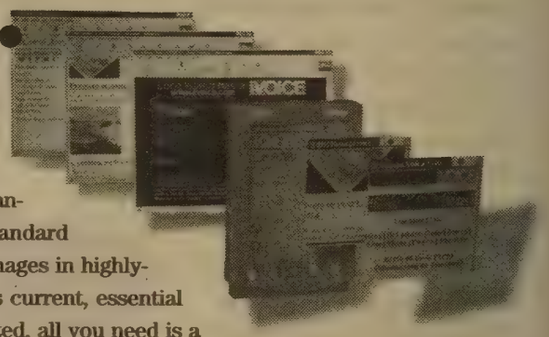
Foresight Software, Inc. shipped **Service Management System 8.1**. This company field service and support solution includes enhanced help desk, integrated Graphical Dispatch Board, SiteWare and Enterprise Resource Planning capabilities. ($3,500–5,500) Foresight Software, Inc. (770)206-1000. *www.foresight-esp.com* .

Maximizer Technologies Inc. announced its **Pocket Maximizer 5.0**, a customer and contact manager for Handheld PCs running Microsoft Windows CE 2.0. with an Explorer-style interface. It links to Pocket Word, sends email with one click, and synchronizes with desktop PCs. ($69) Maximizer Technologies 1-800-804-6299.*www.maximizer.com* , *info@maximizer.com* .

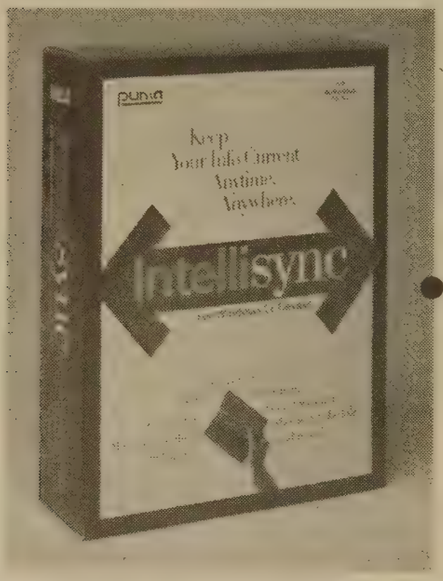
Multiactive Software Inc. unveiled **Maximizer 5.0.** a customer and contact management software. Includes a full suite of e-commerce features that enable a user to create a Web site and start accepting orders and inquiries online—in under an hour. ($149, registered users can upgrade for $79.95 until July 31) Multiactive Software Inc. *www.multiactive.com* .

Mobile Software

AvantGo Web Client and AvantGo Desktop



This software for mobile professionals extends the reach of corporate intranets and the Web to handheld computers. AvantGo Web Client provides information to workers on-the-go with a highly-efficient Web browser residing on their handheld computer. By simply tapping on hypertext links with a pen, you can quickly scan documents of interest. AvantGo Desktop enables mobile professionals to easily define how sets of HTML pages, called "channels," are managed on their handheld computers. It stores industry-standard HTML and text files, as well as GIF and JPEG graphics images in highly-compressed formats to conserve memory. AvantGo offers current, essential intranet information delivered to your pocket. To get started, all you need is a desktop or laptop computer running Microsoft Windows 95 or NT and a handheld device with its included cradle or docking station. ($99 per seat for corporate users. A free 45-day evaluation is downloadable.) AdvantGo, Inc. (650)638-3399. *www.avantgo.com* .



Intellisync for Windows CE 2.0

This management software provides users of Windows CE 2.0-based handheld PCs with an easy method for synchronizing data with a variety of PC-based personal information management (PIM), contact management, and groupware applications while continuing to support existing devices for Windows CE 1.0. It also provides a custom filtering feature that allows users to conveniently select and synchronize only the information they want. It supports the new generation of Windows CE-based handheld PCs. Puma's DSX technology is the core of all Intellisync solutions and accurately synchronizes information between popular contact and scheduling applications and mobile devices. ($69.95) Puma Technology, Inc. 1-800-774-PUMA. *www.pumatech.com* .

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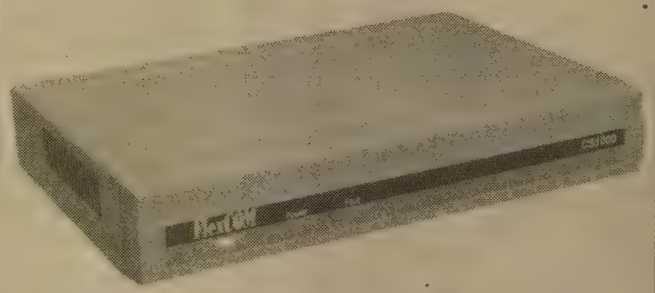

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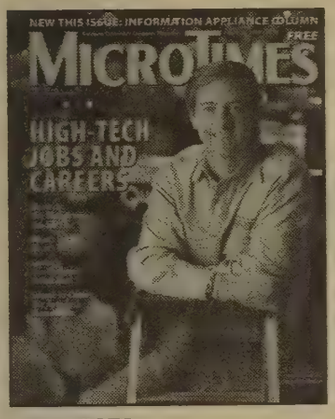
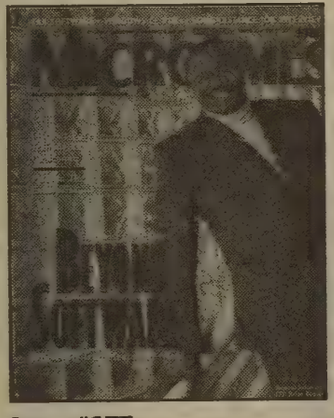


Issue #178

High-Tech Jobs/Careers

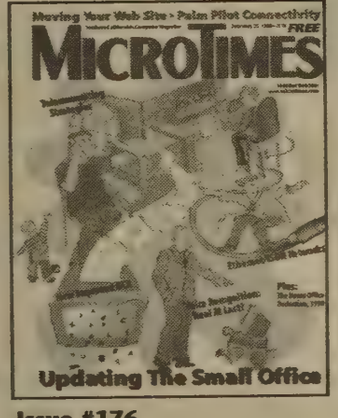
We examine the red-hot high-tech job market in this issue. Our cover story features Fred Faltersack, co-founder and CEO of Westech. Faltersack talks about his company's products and services and offers advice to job seekers. Our Editorial Assistant Sara Tassione presents a survey of hiring managers and agencies as to what's hot and how to benifit. In other stories, Peter Linde devotes his portion of the BMUG column to explaining the user group's role in your job search; also, Associate Editor Michael Robin takes a look at the School-to-Career program of the Autodesk Foundation.



Issue #177

Enterprise Computing, Intranet, Extranet

We survey the rapidly-evolving world of large-scale enterprise computing. We visit with Brian Reaves, CEO of San Jose-based Beyond Software, a startup helping Global 2000 companies make their mainframe-based legacy data legacy accessible in a Web-based environment. In related stories, Ivars Bezdechi looks at Qualcomm's intranet-based employee training program, and Peter Linde points out how, contrary to the current prevailing view, Macintosh is actually a preferable platform in the corporate environment.



Issue #176

Small Office/Home Office

We proudly present a number of stories of interest to those working in a small office, whether home-based or not. From voice recognition to OCR, new technologies are making it easier to work with your computer, and new Ethernet/ISDN networking hardware helps your office maximize its productivity. We also examine the joys of moving one's Web site and offer advice for surviving the experience.

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Gulch Gossip

By Jonathan E.

Perhaps Mr. Ellison will donate a week's cruise on his yacht to another social services agency to auction off, one that needs it more than the Woodside School Foundation

If Woodside Could Side Who Would Woodside Side With? Cyberselfish?

Chris Nolan, the Other Gossip Columnist as I call her (she omits the adjective), in her Mercury Center **Talk Is Cheap** column (*www.sjmercury.com/columnists/nolan/docs/cn051498.htm*) made a very good point while writing about the high bidders at the **Woodside School Foundation's Fifteenth Annual Grand Auction**, a social event of great importance in that little town of very rich folk.

According to Nolan, even some of the parents of Woodside recognize that the need to hold an auction is "a sad sign of what's wrong with the state's tax system" caused by Proposition 13, which "has forced all of the state's school districts to raise funds for things that were once considered school basics."

Ellison

It seems a little incongruous that a town of such high property values—many of them assessed more recently than 1978, the time of Proposition 13, and thus not frozen at that year's much lower property values—should have such fiscal restrictions and hurdles. It also seems unlikely that such folks would actually relish the idea of being taxed for whatever purpose; it's not their usual style of survival-of-the-fittest libertarian thinking.

Indeed, one suspects that they doth protest too much. As Nolan points out, "There are plenty of places in California, some only a few minutes' drive away from Woodside, that have to address the same problems with bake sales and car washes instead of auctions and fund drives." Reportedly such fund drives enable the Woodside School Foundation to give $700,000 a year to the Woodside School District. But do we hear of any thought given to sharing that bounty with those more impoverished districts, "some only a few minutes' drive away"?

No, we don't. That would simply be too radical an idea for a libertarian or most wealthy folk to grasp—and the marketing would be difficult. Instead, they'd rather chatter on about who was the anonymous bidder of $125,000 "for a week-long cruise on **Oracle CEO Larry Ellison**'s really big yacht, Sakura." Surely a purchase in extremely dubious taste, but one that will keep the social rumor mill grinding away until the successful bidder's identity is inevitably revealed and he or she achieves the social status that is the real driving force behind such charity events.

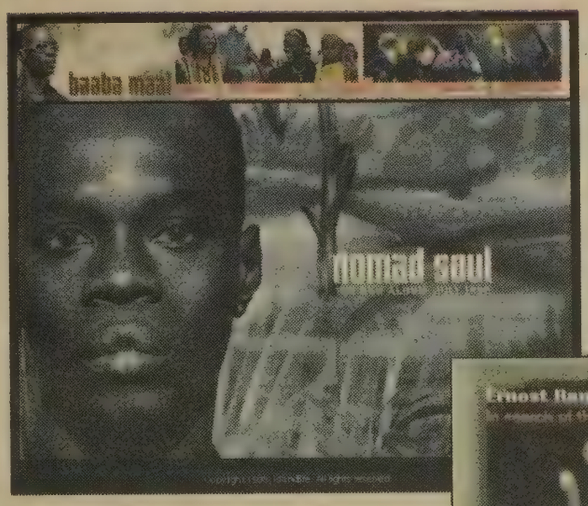
Woodside's exclusivity—tickets to the auction were $200 each—speaks louder than any desires its residents may have for coddling even their own children, let alone offering a helping hand to their neighbors. The public image of the Peninsula and its Valley is indeed silicon-coated, with extreme emphasis lavished on its successes. Of course, it's not the whole story.

Jan Boyd reveals a broader and truer picture with elements that are too often forgotten in her moving ***New Media News*** piece at *http://newmedianews.com/jan/1998/j051198.html* . She presents a powerful contrast between her life as a television reporter covering the highest of the tech and her brother's work as a police officer dealing not just with the lowest of the criminal low but with everyday human tragedy, and at real personal risk. It's a truly powerful

piece of writing and highly recommended for all who think that CRTs, microprocessors, and IPOs are mainly where it's at. Perhaps Mr. Ellison will donate a week's cruise on his yacht to another social services agency to auction off, one that needs it more than the Woodside School Foundation and one that uses the word social in its other, more encompassing sense.

Now, it's nothing new for the cyberwealthy to be slapped around for their rather—umm, how shall I put it?—discriminating giving. **Tom Abate** made mention of it in his gushing coverage on **The Gate** (no, I don't read the papers!) of the **Exploratorium**'s recent fund-raiser—not that his coverage gushed half as much as The Other Gossip Columnist's. ***The Economist,*** in a recent article on philanthropy in America, remarked that Silicon Valley "companies seem more likely to boast créches for their employees' pets than programs designed to assist the poor and unskilled who are being priced out of the area's soaring property market. When the geeks do stoop from time to time to charitable work, they tend to do self-serving things such as providing local schools with free computers." Ouch!

If she were old, **Paulina Borsook** might be called the grand dame of such critical thinking, having originally set her sights on the issue several years ago in a story in ***Mother Jones*** entitled "Cyberselfish." She's currently finishing up her new book of the same name, which she promises to be "a more raucous, irreverent, snotty, and gonzo critique of Silicon Valley culture." She talks so fast that my notes are even more fragmentary than usual, but as far as I can tell from my scrawl she's mounting a full-on assault aimed at the Valley's libertarian tendencies, with caustic coverage of its need for business dominance, the myth of the entrepreneur, crypto-crazed cypherpunks aping the style and attitude of the militia movement, the role ***Wired*** played in glamorizing this mess, and, of course, the poverty of real philanthropic giving in the Valley, what she calls the "Cat and the Dead Rat" practice of giving what the giver values but the recipient has less interest in. It sounds like a great read from a malcontent with something to say, and hopefully it'll really stir things up. **Broadway Books** is the publisher, and it looks like it's due in the stores in late fall.



Nomad Soul—Eno Doubles His Effect

This month's heavy-duty recommendation to follow **Brian Eno**'s advice and get some more Africa into your computers concerns **Baaba Maal**. Besides **Salif Keita**, covered in last month's column, Maal is Mali's other leading musician, taking the best of the modern world with all its electronics and communications and twisting it together with an older, more rooted concept of life and culture into one braided connection that adds value (now, there's a Silicon Valley marketing expression) to both strands.

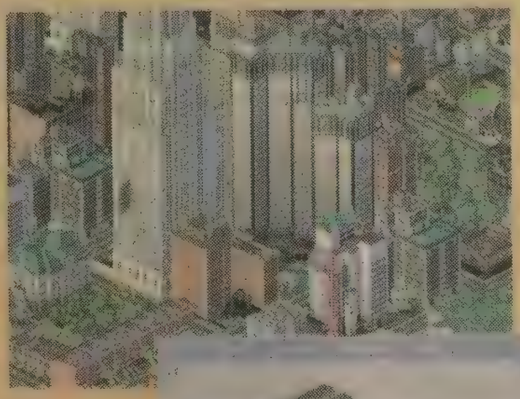
His new album, ***Nomad Soul***, is just out. It's one of the first releases on the legendary **Chris Blackwell**'s new label, **Palm Pictures**, a label that seems set to be part of a full-scale multimedia lifestyle company, **IslandLife**, producing and distributing DVDs, CD-ROMs, theatrical films, Japanese manga animation, as well as old-fashioned CDs. IslandLife also has some nice looking resort hotels, two with their own recording studios, scattered around the Caribbean, while the Marlin in Miami features WebTV in every room. You can find out plenty more for yourself at the Web site, *www.islandlife.com*, where you can even buy some of the last remaining **Bob Marley Songs Of Freedom** CD sets. *Nomad Soul* includes a contribution from Brian Eno, along with **Howie B** and **Jon Hassell** on a distinctly different soundscape of drifting electronics, trumpet,

Shaping SimCity

Following the Multimedia 101 column on the **Shaping San Francisco** CD-ROM (*www.microtimes.com/179/mm101.html*), **Jim Gasperini** emails in with what might be described as better information, AKA egg on my face: "One point about the 'meter designed to tell you how much of each subject you've seen,' which you say you haven't seen implemented before. This is a key feature of the CD-ROM structure created by the French company **Index+** for the Louvre disk (co-produced with **Montparnasse Multimedia**), which they have used on all their art disks since, including the **Musee D'Orsay** disk, their **Michelangelo** disk, etc."

Ahh! Those French! So advanced, so civilized! Now, if only we had a CD-ROM market that would support such innovation. If only I received a review copy of every CD-ROM in existence and had time to contemplate them all!

One CD-ROM that would be interesting to contemplate is that of **Jim's mother** about her time in the Red Cross during World War II. Jim thinks it's "perhaps the first CD-ROM by an author pushing 80." No word on commercial publication as yet.



SimCity 3000

However, **SimCity 3000**, the design of which is Jim's day job, is close to launch: "Things are going well at Maxis. SimCity 3000 got such positive attention at E3 (picked as one of top three titles showing by ***Time***, ***Newsweek***, some gamer press) that sales forecasts have been doubled and Electronic Arts is all hot about it." Hinting that it's perhaps more than just a day job right now and alluding to that well-known stage of production that comes just before shipping, he adds, "Now we just have to get it finished!"

and clicking rhythm. Other tracks produced by **Simon Emmerson** of **Afro Celt Sound System**, **Ron Aslan** of **Raw Stylus**, **Mykael Riley** of **The Reggae Philharmonic Orchestra**, and **Paul "Groucho" Smykle** of many credits take Baaba Maal to Ireland to meet **The Screaming Orphans**, **Sinead O'Connor**'s backing singers, to Jamaica for a duet with **Luciano**, and back to Mali for a serious percussion workout.

Overall, it's perhaps not quite as astounding as his previous release, **Firin' In Fouta**, but the high points exceed anything he's previously done.

Baaba Maal is nomadic through northern California at the beginning of August. You'll be able to catch him live on August 1 at the **Reggae On The River Festival** in Pierce, August 2 at **Palookaville** in Santa Cruz, August 3 in Davis at **The Quad** on the UC campus, and August 8 at the **Maritime Hall** in San Francisco. The amazing guitarist **Ernest Ranglin** from Jamaica will appear with Maal at the Reggae On The River and Maritime Hall dates. His jazzy-flavored album of reggae classics, **Below The Bassline**, was a musical tour de force, a highlight of 1996, while the early 1998 release, **Memories Of Barber Mack**, was not far behind.

A new album recorded in Africa with contributions from Baaba Maal, **In Search Of The Lost Riddim**, is another of Palm Pictures' first releases. Unheard by me at this time, it's eagerly awaited and you should be able to find samples from it on the IslandLife site. Fancy that! African music from your computer! Sounds like Eno's advice is being followed.

Mox, Meet jhno, Get To The Stillpoint

It's not only nomadic visitors from Africa who combine the old with the new in a musically interesting space. Some of our local residents and labels have recently presented their visions of a better sound to the world.

Mox are a trio of composers and sound designers who mostly work on TV commercials and fashion shows. To stay sane, they make their own music and create sound installations for arty and public venues like the **San Francisco Museum of Modern Art** (where they're in the permanent collection), the Exploratorium, and the **Monterey Bay Aquarium**. **RGB Records**, the **Hearts of Space** label that releases sounds from the poppier end of the electronic spectrum, collected the best tracks from Mox's three privately released albums onto one new CD, also called Mox. I'm not sure whether there's a pun involved there or not.

The sound is a swirling mix of elements with some vague familiarities and considerable charm. While it's basically instrumental, there are some background voices that I'd guess were sampled from various world music genres (those vague familiarities) but mostly you'll hear plenty of guitar and keyboards atop mid-tempo percussion. All three members are credited with "machines."

Mox are notable in that they successfully bring substantial pop rock elements into territory where they usually sound out of place. You'll find more at *www.rgbrecords.com* or, to check the entire Hearts Of Space venture, go to *www.hos.com*.

Look for a new release on the Hearts of Space label in August from Stanford electronics pioneer **Robert Rich** in his earlier style, featuring guitar wiz **David Torn**. Also in August, there'll be a new **Tuu** album, said to be quite wonderful, on the **Fathom** label. Already out on **Hearts of Space** and not to be missed is **Sacred Treasures, Choral Masterworks from Russia**, a truly spectacular collection from various Russian and Bulgarian choirs.

jhno presents a very dark and viscous sound on his CD, **Kwno**, on his own **Delicate Ear** label. jhno is quite the digital multimedia artist, specializing in sound but able to hack some code too. His Web site at *www.sirius.com/~ear* includes downloadable programs that will let you do various cruel things to sound—not to mention what I think are some very poetic words about paragliding, along with his photographs, explanations of what he intended with Kwno (and a pronunciation guide to that title and his name), and pictures of his **Thing**—the Volkswagen Thing, not what is so often associated with musicians and that word.

jhno is also an interactive music programmer for **Interval Research**. As you might expect from so much accomplishment, Kwno is both varied and good. I usually don't care much for jungle or drum'n'bass styles but jhno makes them palatable through his musical taste. It's not typical drum'n'bass in the British style and, while his earlier singles achieved notice in the dance community, I don't know how you'd dance to the album although you might be able to twitch quite well. Of course, his Web site includes Real Audio, so just go there and listen for yourself—this sort of music is so abstract it's near impossible to describe.

City of Tribes Records have domestically released a reworked version of **Stillpoint**'s previously limited-edition import CD **Maps Without Edges** on **Beyond.** Two of the members of Stillpoint, **Nick Parkin** and **Martin Franklin**, also play with Tuu (see forthcoming Fathom releases above) while the third is **Eddy Sayer**, an original member of **Lights In A Fat City**, forerunners of **Trance Mission**—so perhaps you'll have some idea of what musical universe Stillpoint inhabit even if the map has no edges. It's as abstract as jhno's but the mood is quite different—not as dark, not as edgy, slower, calming, more inwardly directed, definitely more acoustic and organic, although still suffused with electronics. Occasionally it's reminiscent of **Jon Hassell**'s better work.

It's a good thing that City of Tribes made it more readily available. The Web site is at *www.cot.com* for the further details. This would be good music to listen to after being yelled at.

Not Clear On The Concept?

Many of the job listings that come through the **List Foundation**, previously known as **Craig's List**, cause me to scratch my head, roll my eyes, and generally wonder about just what grip on reality the posters maintain. (Well, it makes a change from simply wondering about my own grip on anything at all.)

However, one in particular recently seemed to be extremely unclear on the general concepts, and indeed practices, of electronic communication. Firstly, the Pacific Heights company appears to be called "**Startup**," surely not an image one would wish to maintain for very long, but that's the domain name the email originated from. One assumes that's an authentic return address, not a faked one as so much obnoxious spam uses these days, because the listing goes on to ask for the usual broad range of creative and technical skills including knowledge of "the latest software tools to integrate threaded discussions via Web conferencing, chat forums, mailing list, and possibly free Web-based email."

So, it would seem likely that faked return addresses might be beyond the ability of the poster. But perhaps not! The listing then directs job seekers to "forward resumes" to a street address and requests "no emails pls." What competent "multi-talented Web Developer/Designer with strong graphic, Web design, and server administartion [sic] skills" and "Familiarity with UNIX, Windows NT, and Mac platforms" has the time to do their resume, let alone put it in the mail? And, if you've got email, why bother—unless it's a faked address? ◆

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EE Pro/10+ w/o Flash 20-Pk/80-Pk	956/3,630
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ASANTE AsanteFast 12-pt 100BTX/16 Port	700/1,016
BAY NETWORKS BayStack 202 12 100BTX	1,193
CISCO Fasthub 16 100BTX	827
HP AdvanceStack 12 100BTX/with MGMT	1,026/2,052
AdvanceStack 24 100BTX (J3272A)	1,087
INTEL Express 8 port stand alone hub 100BaseTX	480
MICRODYNE Century 6 Port 100BaseTX hub	364
NETGEAR FE104 4 100BTX,FE108 8 100BTX	139/231
FE508 8 100BTX Stackab eFE516 16 100BTX	464/754
SMC EZ Hub 100 8-pt 100BTX Hub	282
TIGERSTACK 100 12-pt 100BTX SMC5312TX	1,116
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Intel Express EE110 10/100 Hub 12-pt/24-pt	1,016/1,440
EE220 10/100 on each port 12/24	941/1,325
NETGEAR Dual Speed 8-Ports	298
Dual Speed 8-Ports Stackable/16-Ports Stack	516/955
SMC EZ Hub 12 Port 10/100 hub	900
EZ Hub 24 Port 10/100 hub	1,351

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IBM Turbo TR 16/4 Type1/ 3 Single/PCI	216/296
PROTEON P1394+ Token Ring 16/4/10-Pk	210/2,016
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BM PC Card Coax/TP Adapter	242/261
Turbo 16/4-TR PCMCIA2 Adapter	294
INTEL EtherExpress Pro/100 Mobile 16-BIT	150
EEPro/100 Mobile 16BIT 5PK/20PK	714/2,610
EEPro/100 Mobile 32BIT SINGLE	158
EEPro/100 Mobile 32BIT 5PK/20PK	756/2,691
XIRCOM PC Card IIPS 10/100BTX	166
Real Port PC Card 10/100+ 56K V.90/20PK	366/1,682
PC Card Enet 33.6 Modem & Fax 10BT/Combo	279/315
Card Bus 10/100BTX (CBE-10/100BTX)	163

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HEWLETT PACKARD 10BaseT Hub 12 (J3300A)	264
10BaseT Hub 12M 12 Managed Ports (J3301A)	491
10BaseT Hub 24 (J3302A)/ 24M (J3303A)	399/759
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SuperStack II Desktop Switch 24TP,1 100BTX	1,247
SuperStack II Switch 320 12 10BT, 2 10/100BTX	658
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ASANTE ReadySwitch 4 RJ45, 1 Fast Ethernet	1,253
IntraStack 6014 DSB 12 10/100 ports	2,455
BayStack 301 22 10BT, 2 100BTX	2,727
BayStack 302 8-10BT, 1-100BTX	1,772
BayStack 303 24 10BT, 1 10/100BTX	1,138
BayStack 304 12 10BT, 1 10/100BTX	906
BayStack 350T 16PT 10/100BaseTX switch	1,897
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CISCO CATALYST1912 12 10BT/1 100BTX	1,230
CATALYST 1924C-A 24 TP,1-100BTX,1-100BFX	1,620
CATALYST 1924-EN 24 10BaseT,2-100BTX	1,210
CATALYST 1924 24 10BastT, 2-100BTX RMON	1,608
HP AdvanceStack Switch 208 8-10BT,1-100BTX	780
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NETGEAR SW510 8 10BT + 2 10/100BaseTX	619
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FS102 2 10/100 + 2 uplink/FS104 4 10/100	252/458
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SSII Switch Matrix Cable/Module	100/743
SSII Switch 3900 24 10/100 ports, 1 GBit port	5,354
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INTEL ES510T 24 PORT 10/100 Stackable Switch	2,633
ES500MTX 4 PORT 10/100 Module for 500 Switch	694
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Open File Agent for NW/Disaster Recovery	426/324
SEAGATE Backup Exec 1 Server 25 Users	329
Backup Exec Single Server/Enterprise NLM	462/922
Backup Exec Autoloader Option	393
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EXABYTE EXB-8700LT 8mm 7-14GB drive only	720
EXB-8700SW 8mm 7-14GB w/ Server software	1,002
HP C1554 DDS3 4mm 12-24GB DAT Int/Ext	1,045/1,145
C5648A 72-144GB DDS3 int. autoloader	2,744
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ARTISOFT InSync Modemshare 1/2/4/8Pt	138/198/383/560
CISCO 2501 1 ENET, dual serial router (software req)	1,906
2514 2 ENET, dual serial router (software req)	2,340
EMULEX Connect Plus 2 ports/8 Ports	582/2,262
NOVELL NetWare Connect 2	353
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SHIVA Netmodem/E 28 8/AccessPort D Enet	871,690
Lanrover/E Plus w/2 Async ports/4 Async	1,334/2,532
Lanrover/E Plus w/2 v.34/8 PT w/4 v.34	1,771/3,320
Lanrover/E Async 8 Async/8 v.34 modems	2,810/4,528
DIGI INTERNATIONAL Dig 2-Pt/4-Pt,8-Pt	200/455 588
Acceleport 8EM w/RISC CPU, DB25 ,SA,PC	673 673

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Pipeline 25-FX Bridging	457
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Pipeline 50 w/ 1 Lease 56 & 1 SW56	1,196
Pipeline 75 Multi, PX, P, 2 Analog	679
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Pipeline 130, SDN & L56 SW & L56	1,342 1,412
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SHIVA Lanrover/E Plus 1-BRI ST, v.34, 3 CHAN	1,918
Lanrover/E Plus 2-BRI ST, 4 Channels, Enet	2,075
Lanrover/E Plus 4-BRI ST, 8 Channels, Enet	3,929
US ROBOTICS Sportster ISDN adapter	188
DataBurst Ext. Parallel Port ISDN w/NT1	275
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3150 T-1 Frame Relay CSU	1,157
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D-SERV FrameRelay up to T1 CSU/DSU	978

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3COM OfficeConnect ISDN LAN modem	419
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Gateway 535 ISDN IPX to IP	1,453
BAY NETWORKS Instant Internet 100 1 ENET,ISDN	757
100 w/ 1 Enet, 33.6/1 Enet w/ 56K x2	602/757
20 Usrs 1 Enet w/33.6k/2 Enet W/ 33.6	1,896/2,086
20 Users, 1 Enet w/ ISDN/2ENET w/ ISDN	2,200 2,403
100 Users w/ Dual-Enet & DDS support	3,159
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Netopia Internet Rtr TCP/IP 29-Users/ Unlimited	569 624

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JetDirect Token Ring EX/EX Plus3	567 682
INTEL Netport Express Pro 10BT Int(MIO)/3 Pack	299,747
NetportExpress Pro 10BT Ext. 2P/1S/3 Pack	391/1,068
NetportExpress Pro 100 10/100BTX 1P/3Pack	273/739
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CASTELLE FaxPress 1500 1-Line/2-Line	1,970 2,365
Faxpress 3000 2-line/FaxPress 3000 4-line	2,948 3,574
Faxpress 3500 2-line/FaxPress 3500 4-line	3,434 4,088
CHEYENNE FaxServe NLM 5/10/25	358,658 1,078
FaxServe NLM 50/100/250	1,679/2,333 3,545
FaxServe for WinNT 5/10/25/50 Users	238/420/839/1,319
LANSOURCE FAXport 5 Users/10 Users	273 406
FAXport 25/50/100	676 999 1 300
FAXport 4 modem add-on	204
FAXport 5 User add-on,Unlimited Users	204 1 900

Uninterruptible Power Supplies

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Back-UPS Pro 420 650/1000 1400	251/310 404 52
Powerchute Plus for Novell, Unix,Windows NT	99 149 99
Smart-UPS 700NET,1000NET,1400NET	389,540 67
Smart-UPS 2200NET/3000NET	1,067/1,786
Matrix 3000/5000/Smartcell	3,720 4,616,537
SNMP Agent for Novell/SNMP Mgr for Netware	125 145

Cable Testers & Supplies

RJ45 10 BaseT Connectors (100 pak)	40
10Base-T Cable (1000' min) LV3/LV 5	100 200
FLUKE LAN CableMeter 620,CableMeter 650	728 1 760
MICROTEST Cable Tester	300
Penta Scanner w Super Injector	3 019

E-Mail

MS Exchange Server Single w/ 5/10/25	1,014/1,368/2,160
Exchange Server Enterprise w/25/50 Clients	4,099,5,429
Exchange Add'l Clients 5 20	366 1,160

Network Management

3COM Transcend Workgroup Mgr for Windows	461
Transcend Enterprise Mgr for Windows	2,396
APC Master Switch E515 (Remote Power On/Off)	492
HP Openview Pro Suite	1,037
NTE_ LanDesk Mgmt Suite 5 10/100 Users	522 696 4 240
LanDesk Server Manager Pro	864

Network Utilities

CHEYENNE AdduWare for NDS 100 Enterprise	4c, 851
Directory Mgmt. Combo Enterprise	850,1,951
InocuLAN Wrkgrp/1Svr-Unlimited	301 600
InocuLAN 5 Svr-Unlimited Users	2,363
InocuLAN Option v4 0 for AS 6 for NW	298
INTEL LanDesk Virus Protect Single Svr NW&NT	329
Single Svr w unlimited clients	1,055
Client Access License for LanDesk Virus Prot 5 25	94 482
SEAGATE Prepare! Disaster Recovery SW	459

VINCA Server Mirroring

CHEYENNE ArcServe Replication for NT	1,798
VINCA Campus Standby Server Software for NW	2,955
Standby Server NetWare/Windows NT	2,954/2,586
Entry StandBy Server/SnapShot Svr for NW	985/757
Standby Server Many-To-One	5,172
CO-Standby Server for NT	2,990

Windows NT Solutions

3COM Transcend Workgroup Mgr for NT	463
Transcend Enterprise Manager	2,353
CHEYENNE Arcserve for Windows NT v6.5, Single Svr	350
Arcserve for Windows NT v6.5 Enterprise Edition	675
Arcserve Storage Suite-Backoffice Sm Bus. 5 Usr	242
Arcserve Storage Suite-Backoffice Sm Bus. 25 Usr	394
Arcserve Push Agent for NT or NetWare	330
Arcserve Tape Lib Option for Windows NT	365
Arcserve Disaster Recovery Option for NT	236
InocuLAN for Windows NT 1 Svr,Option for NT	500 296
Open File Agent for Windows NT	421
Protection Suite for Exch Single Enterprise	1,183 1,600
INTEL Landesk Workgroup Mgr 25	1615
LANDesk Virus Protect NT	1 028
MICROSOFT Windows NT Workstation	317
Windows NT Server w 5 10 Clients	810 1,126
Windows NT Client Single 20 Clients	34 658
SMS System Mgmt Server w 5 Clients	943
Proxy Server for NT4	995
SEAGATE Backup Exec for NT 1 Svr Ent	493 864
Backup Exec Autoloader for NT	434
Open File Manager for NT Disaster Recovery	425 328

Servers/Network Computers

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Netserver E50 P2/300, 64MB 4GB,24X	2,588
Netserver E45 P2/266, 32MB,SCSI 24X	1,806
Netserver E45 P2/266, 64MB,4GB 24X	2,183
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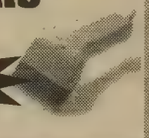

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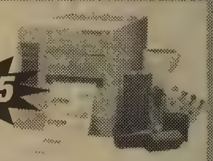

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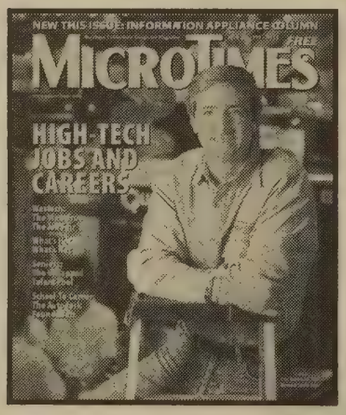

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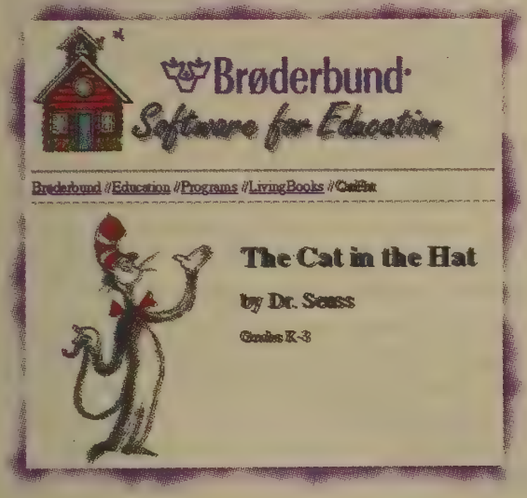
Multimedia Now!

The State of Edutainment

By Jonathan E.

Is all that's needed to make the educational edifice functional again a shot of technology?



Ten years or so ago, back when it was "the next big thing" and not just another ubiquitous feature of any consumer machine, readily found in any electronics superstore between the home theater systems and the household appliances, one of the most passionately espoused goals of multimedia was to provide a new and better way of allowing children to learn. The concept of children being able to control the pace of presentation and choose what they saw and heard was thought to have great power. The wonder of audio and video coming from the screens of machines, still commonly considered to be dumb and lifeless, synergetically combined with that power to dazzle us into forgetting just how ordinary it would all become.

It's far too early to tell yet whether educational multimedia has fulfilled its early goals. Certainly, we all know that the business of multimedia is as tumultuous as every other part of the computer and media industries. CD-ROMs, thought to be a sure thing, were rapidly eclipsed in the public eye by the World Wide Web.

In the United States, the very concept of what it means to be educated is changing as radically opposed interest groups tear apart any sense of larger community with endless bickering over the three Rs, the bigger R (religion), and fearmongering over every hot-button topic from sex education to whether American workers will be competitive in the global marketplace of mañana.

In at least some states, California in particular, the physical condition of many schools is utterly appalling. How any child is expected to learn in physical surroundings that continuously tell the child that no one cares and that he or she is little more than a penned-up animal, undeserving of even basic human facilities and respect, is beyond me. Besides the state of disrepair of the buildings, the diminished funding of any so-called extracurricular activities—art, music, drama, the things that make the human experience understandable and bearable—sends today's students the wrong message about their worth and the roles they have to fulfill in the future. Or perhaps, sadly, it's the right message from the point of view of certain political and economic interests. Add to that the intrusion of serious violence and mayhem from some peculiar confluence of gun culture and mass media, and it's a wonder that schools can get anything done at all.

It is this background against which any multimedia-caused improvements to the educational system will be measured. It's certainly no surprise that any even halfway intelligent child would seek refuge in an easy-to-control environment with some nicely defined boundaries—such as a CD-ROM. Besides, computers are officially cool!

However, that background is also dismal enough that simply injecting doses of technology into the situation will not be enough, whether that technology is fully-wired classrooms or an isolated CD-ROM drive with a few educational discs.

Education used to proceed quite well with very little direct reliance on technology of any kind beyond pens, paper, and printing. The products of that education built the complex edifice of today's technological world. But some of the most very basic educational building blocks right at the foundation of that edifice have been allowed to rot away. It is now commonly proposed that all that's needed to make the educational edifice functional again is a shot of technology. Certainly a few CD-ROMs, like the ones discussed below, can help shore up that foundation but, as useful as some of these CD-ROMs might be, far more is required.

The Cat In The Hat

At a certain age, everything is educational. There is no positive experience that is not valuable in some way. So it has been with the Dr. Seuss books, including his much loved *The Cat In The Hat.*

Traditionally, your mother would read it to you, pointing out the words, encouraging you to turn the page at the appropriate time, getting you to talk about what's happening in the pictures. Sooner or later you'd be well on your way to reading for yourself. And you'd probably have absorbed a moral lesson or two about telling the truth and what not to do when your mother's out of the house.

In today's not-so traditional world, *The Cat In The Hat* has evolved into a Living Book from Brøderbund. I pity the mother or father of today's electronically endowed child who has to compete with the fantasies and production values of a Living Book. There's music, and the characters have their own voices (instead of mommy or daddy just pretending); the pictures move and the words highlight and you can click around to make magical little things happen. In other words, for a certain age group, the only thing missing is being held by mommy or daddy—and really they might even be at your side anyway, showing you what you could do with the mouse if you weren't sure.

If there's one category of multimedia that comes close to convincing me that computer media really have a lot to offer, it's well-done children's classics.

The Cat In The Hat is one of those well-done children's classics. It's got all the multimedia bells and whistles that children love and that have become a fairly standard package. Today's busy parents will also find *The Cat In The Hat* a good electronic babysitter with some educational merit—although in some instances, such as when the Cat attempts to balance a whole household's worth of objects, your child may learn more about using a mouse than the real physics of a center of gravity. Any aspiring multimedia worker too old to have grown up with numerous examples of the genre could also use *The Cat In The Hat* as a good design study.

The Jolly Postman's Party

For a murkier, and perhaps more interesting design study, consider *The Jolly Postman's Party*, another children's CD-ROM based on a popular book making educational claims. It's more ambitious than *The Cat In The Hat* in that it's a lot more activity oriented; in fact, it's really a very limited version of Brøderbund's Kid Pix Studio Deluxe, discussed in last month's Multimedia 101, but framed within a virtual social setting with some characters to add a bit of color. There's no story to talk of, and it's not designed to help a child read.

Its educational aspects again rely on the fact that just about every positive experience is educational at a certain age. In *The Jolly Postman's Party*'s case, the educational features are primarily aimed at developing communication skills. Up to 36 children can use a single copy to send each other cards that they've created using its art features, which can also be used to print out party hats and masks and things like a cut-out tea set. All of which is an improvement over going to one of those horrible suburban stores full of pre-made party favors and decorations. However, I'm of the opinion that old-fashioned paper, cardboard, scissors, messy markers, and paint would be even more fun and encourage more creativity. A common claim for using a computer in this fashion is that it teaches children to use computers. However, the interface for the painting tools and card making is distinctly non-standard, rather too cutesy—nothing like a real paint program—and uses a typewriter, sheets of paper, and envelopes as metaphors, all of which seem to me would be a hindrance, something to later unlearn, for any child making their first mouse clicks.

If you thought CD-ROM was slow, just wait until you try it side-by-side with a consumer Internet connection.

Besides being able to send cards to other local users of *The Jolly Postman's Party*, you can send cards to the characters at the virtual party over the Internet. Potentially, this could be a great way for younger children to get used to the idea of communicating via computers over a distance. There's a birthday for a different character each month. Send in your card for that character the previous month, and there's a contest for the best card. You can look at the cards for any character's birthday.

But that's it. It's ultimately very limited—there's no way for children to communicate directly with each other, to say, "I really liked the card you made for the piglet." Everything is squeezed through a rather narrow portal. And if you thought CD-ROM was slow, just wait until you try it side-by-side with a consumer Internet connection. While the hybrid CD-ROM/Web parts of *The Jolly Postman's Party* actually worked, and the visual experience was pretty seamless, the repeated "Connecting to the Internet" messages really slowed things down and would try the patience of any child not lucky enough to have a mommy or daddy with a T1 line. Perhaps this explains why each character seems to have only received about a dozen cards.

Beyond its communication skills aspects, *The Jolly Postman's Party* claims educational qualities from its Pat A Cake, Lights Out, and Balloon Game competitive sections. Pat A Cake is a cake-making exercise involving measuring ingredients, and thus basic arithmetic. Lights Out is an observation sharpening exercise where a selection of objects is laid out on the table and then rearranged while the lights are out; your task is pick out what's been moved. The Balloon Game is a slightly bizarre exercise involving letters in balloons that The Jolly Postman shoots down with a catapult; the letters are only in certain colored and shaped balloons, as shown by a placard held up by a duck who quacks every so often to let you know that the desired shape or color has changed. It claims to teach pattern and color recognition—I'm not sure that it isn't like *The Cat In The Hat*'s balancing act in that it really teaches the adroit use of the mouse, which I suppose will be an important skill in the future work lives of many of today's children. Shooting balloons with a catapult is rather fun in a little-boy way, however.

continued on page 164

Interactive Museum Construction Online

Mediatrope Uses Shockwave To Rebuild The de Young

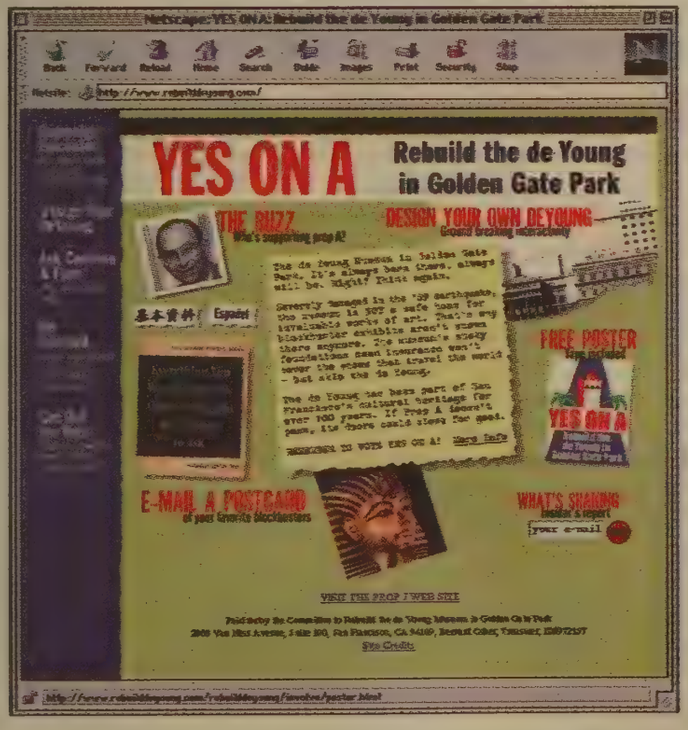
By Tony Reveaux

Mediatrope's Ethan Wilde: "Director's development environment supported all of the interactivity and complex client-server communication the de Young site required."

With the advent of new-generation tools, Web-based multimedia is becoming as rich as its CD-ROM counterpart. Sun Microsystems' Java and Macromedia's Shockwave and Flash are making it possible to duplicate more and more of CD-ROM-scale interactivity on the Web. These in turn provide more ways the Web can compete for advertising, commerce, education, and entertainment. The following are some current examples of how this technology is used to good advantage.

Shocking The Electorate

The Rebuild the de Young page *(www.thinker.org)*, created by Mediatrope Internet Studio in connection with a recent San Francisco ballot initiative, is a good example. It serves up a complex yet accessible and engaging activity, and does so while remaining robust and stable, thanks to its Shockwave implementation. Click on "Rebuild the de Young," then on "Design Your Own de Young," and finally "Visualize a Rebuilt de Young." If you don't already have the Shockwave plug-in, there is a direct link there to download it.



You are greeted with a view of the Museum which then collapses and disappears in an animated earthquake simulation. The land in the window is left clear for visitors to design and build their own museum, as freely and fancifully as they wish. A menu of five libraries of objects, from towers and wings to trees and bicycles, are available to be clicked-and-dragged to the window, re-arranged, and even returned to the library. Designs that are saved and named are stored in a gallery section for all visitors to peruse.

This site design successfully presents an activity that focuses on the social/political/cultural issue at hand in a light-hearted and constructive, playful way that is of interest and accessibility to all age groups.

Mediatrope: A View From The Gulch

Located a couple of blocks down the street from the headquarters of Macromedia in the heart of San Francisco's Multimedia Gulch, Mediatrope Internet Studio was established in January of 1996 to provide Web and multimedia services for marketing and educational content. Mediatrope also offers Web-related services including Internet training and consulting, database management and cross-media content creation. Clients have included Live Picture, Clicquot, Schlage Lock Company, and Swiss cookware manufacturer Kuhn Rikon. Their shop tends to have around five people or so, with some services such as copywriting outsourced.

Mediatrope had an existing relationship with the Fine Arts Museums of San Francisco; it designed, produced and currently maintains the Thinker site, which gives users access to over 65,000 works of art. Explains president and programmer Ethan Wilde of the de Young project: "Our conception for this site was to reach out to the community with an invitation to get involved. Our focus on the museum construction kit and saved gallery of user creations, along with the postcard mailing feature, were direct interactive efforts in this direction."

"The biggest constraint we found in the site was the short development lead time available due to the close election date. Given more time, we would have had better luck publicizing the site prior to the election, thereby maximizing site traffic and media exposure."

The site graphics were produced in Macromedia FreeHand and Adobe Photoshop. All HTML production was done in GoLive CyberStudio and BBEdit. Back-end CGI programming was completed in Perl using BBEdit as an editing environment. The Museum construction game and gallery components were produced using Macromedia Director.

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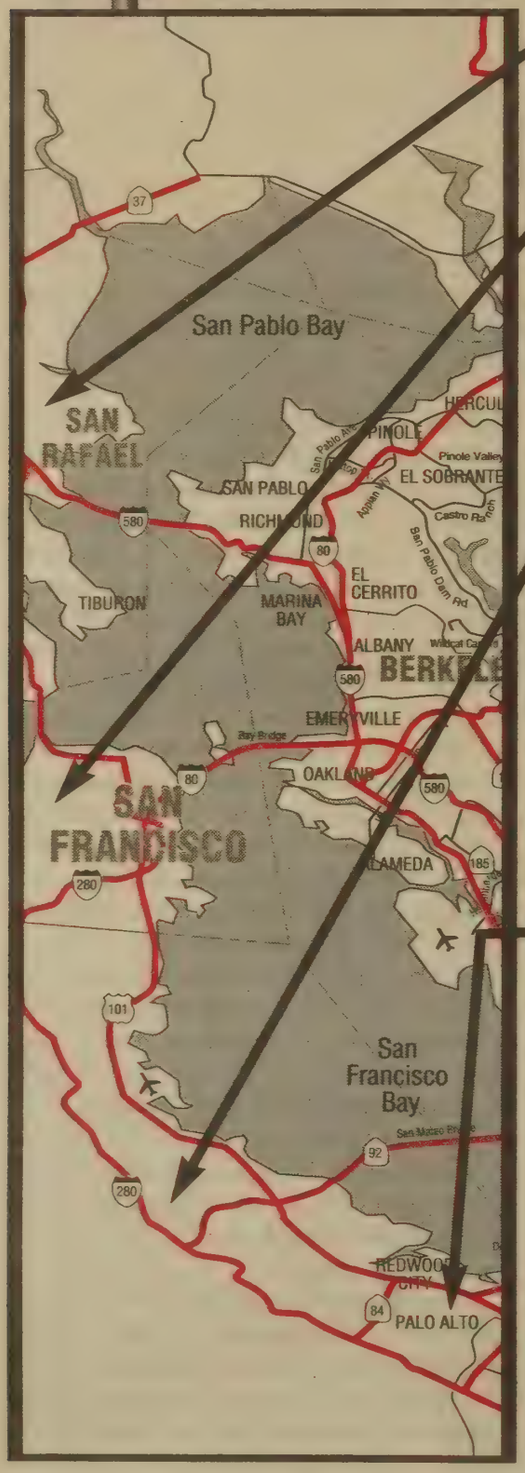

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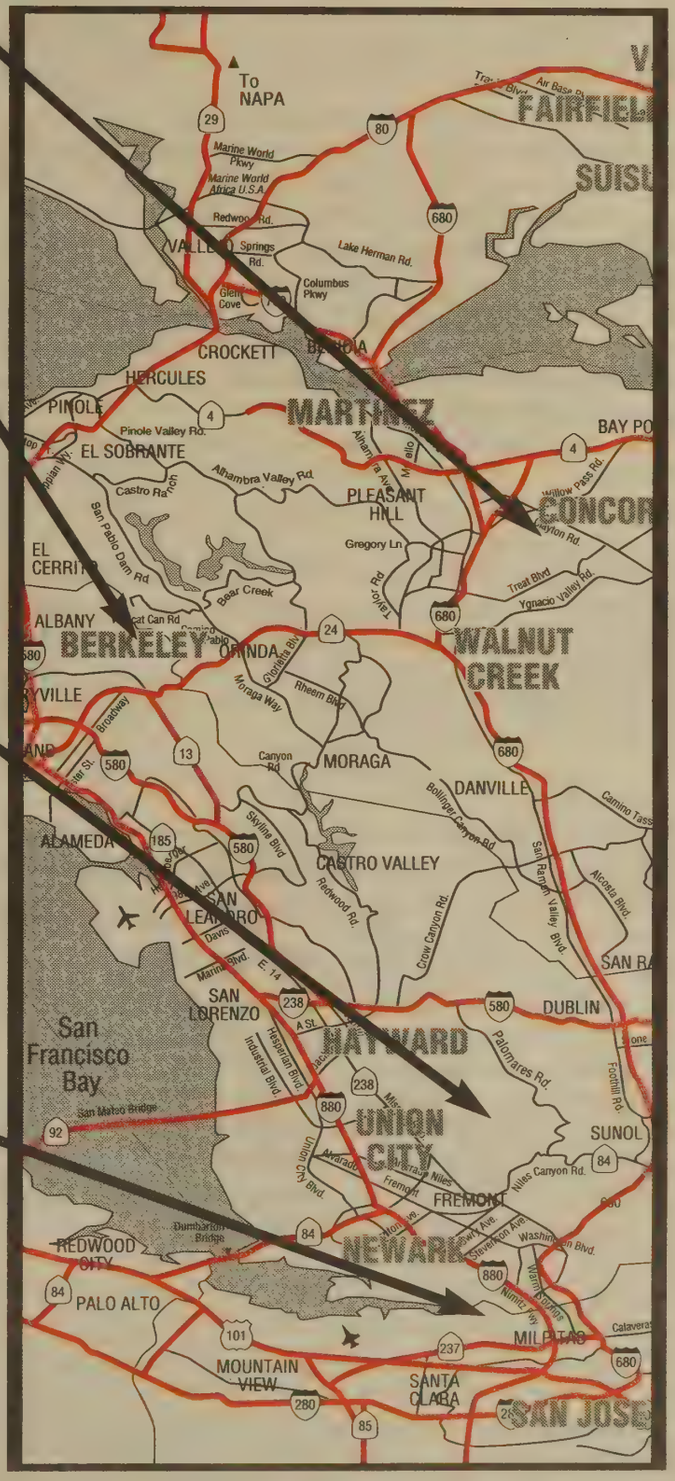

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Mediatrope does all development on Power Macintoshes. Extensive site testing was performed using Macs, Windows 95, and NT4 PCs as well as Solaris and SGI UNIX workstations to ensure maximum brassware compatibility. The site is hosted in-house on SGI UNIX workstations running Netscape Enterprise Server.

Shockwave Vs. Java

Asked about the Shockwave vs. Java decision, Wilde says: "We found that the development environment offered by Director was the most complete and had in its foundation support for all of the interactivity and complex client-server communication needed to support the Gallery feature of the museum construction kit. Client-side Java performance has many problems on both Macs and PCs to this date, including an unacceptable number of system freezes on both platforms and a long start-up time, particularly on Macs."

All of the interactive features found in the game are supported through extensive Lingo programming in Director. The colors and object libraries are stored as castmembers in the Director file.

Any limitations were imposed by bandwidth constraints. "We weighed the value of additional animation and sounds, but found that such features added too much to the overall file size and download time of the Shockwave pieces."

Mediatrope's site development strategy used all focus group data available from the bond campaign committee. This information was invaluable in the initial conception and final look-and-feel of the site as well as the structuring of content. Beta testing of the entire site, including the game, was conducted by Mediatrope with a selected group of users on different platforms and hardware capabilities.

Just Ask Otto

Another site from Mediatrope for the California State Automobile Association exemplifies CD-ROM values and performance on the Web. Says Wilde, "The underlying development environment for both the Museum game and the Otto Club safety card game is the same, Director. There are some similar programming concepts em-ployed, including those related to the ability of users to save their creations to a gallery.

"The audiences for the two sites are, of course, vastly different. As a result, the Otto Club has a much higher level of intuitive design features integrated into it to support the 6–12 year-old age group that comprises the site audience. As well, the entire Otto Club site was developed using Macromedia Flash to allow for maximum interactivity, animation, and user feedback while minimizing file sizes and download times." ◆

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Resources:

Mediatrope Internet Studio
144 Townsend St. #200
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(415)896-2000 voice
(415)896-2212 fax
www.mediatrope.com

The Fine Arts Museums of San Francisco
Golden Gate Park
75 Tea Garden Dr.
San Francisco, CA 94118
(415)750-3614
www.thinker.org

The Otto Club
California State Automobile Association
Children's Safety Awareness Site
www.ottoclub.org

Other Shockwave Sites:
Gapkids
Fly Physics
www.gap.com

Mediatrope's Virtual Petanque
ShockRave
www.shockrave.com

continued from page 160

All these competitive activities have adjustable difficulty levels and a score-keeping function. There's no doubt that a child could be entertained and learn something from them. Even with my reservations about the card-making and art sections, a child could certainly get some positive effects from them.

Overall, however, *The Jolly Postman's Party* falls frustratingly just short of being a good CD-ROM—and that's what makes it an interesting and murky design study. Perhaps recognizing its limitations, it does have a very good help function for each section, where a gingerbread man runs through all the features of the section when clicked. One additional thing to note about the title is that it's a British production from DK Multimedia. Several years ago there was a lot of excitement about producing CD-ROMs that would be sellable all over the world with relatively little regard to local culture. There's still great licking of businessmen's chops over the worldwide aspects of the Web. *The Jolly Postman's Party* indicates that even two relatively close cultures can have quite a gap between them. The Jolly Postman announces his Britishness right in the title and follows it through with British accents from the characters right through to the tone of the ringing telephone. The graphic style seems rather British, much more whimsical than most American designs. When the lights go out in the observation exercise there are even a couple of sound effects that some Americans would probably consider risqué in the current climate of political correctness. In fact, they are innocuous enough, just thoroughly British in their humor.

America is notoriously xenophobic, an interesting consideration when it comes to a foreign multimedia product finding its place in the American marketplace.

America is notoriously xenophobic, an interesting consideration when it comes to a foreign multimedia product finding its place in the American marketplace. Given the vast quantities of its culture that America exports and its lip service to the principles of free trade, it would be nice if *The Jolly Postman's Party* had at least a few American attendees, even if they were only there for the design.

Next month, Multimedia 101 will look at some educational multimedia designed for slightly older individuals and even for grown-ups. Yes, we'll finally meet Carmen Sandiego and learn about Dealing With Difficult People! ◆

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Resources:

The Cat In The Hat
By Dr. Seuss
Hybrid CD-ROM
Living Books
Brøderbund Software, Inc.
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***The Jolly Postman's Party*, $24.95 SRP**
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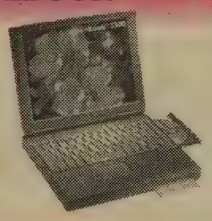

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16-Bit stereo/3D Sound System with Hardware WaveTable
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PCMCIA Two type II one type III slots,
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Li-Ion Battery, AC Adapter, Carrying Case

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Pentium II-266 MHz $2820

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Calendar Of Events

July 11

Computer Show and Internet Expo

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July 13–17

Internet World Summer '98

Chicago, IL

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July 19–23

Siggraph 98

Orlando, FL

This is the 25th year that the computer graphics community has gathered to size up and advance the creation of a future improved by computer graphics. Let Siggraph 98 be your real-time guide to where computer graphics and interactive techniques are going. Get hands-on with precompetitive products and interact with their creators. Contemplate a milestone display of work from artists around the world who are redefining the role of computers in human expression. Refresh your senses in the Electronic Theater and experience the best in animation, interaction, and performance. This conference is a multiplier of imagination, where everyone is a creator. Where there is something for everyone who feels the thrill of computer graphics and interactive techniques. Where anybody who leads and works in this fast-paced industry needs to be. *www.siggraph.org/s98/s98main.html*.

Conferences, Shows, Special Events

July

July 10–12 Brave New Home Expo. San Francisco. Habitat For Humanity. Contact: (925) 439-0434, or *www.newworldexpo.com*.

July 11 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041, or *www.robertaustin.com*.

July 12 MarketPro Computer Shows & Sales. Civic Auditorium, Stockton. MarketPro. Contact: 1-800-708-7555, or *http://marketpro.com*.

July 13–17 Internet World Summer '98. Chicago, IL. Contact: *http://events.internet.com/summer98/*.

July 18 MarketPro Computer Shows & Sales. Centre Plaza at Double Tree, Modesto. MarketPro. Contact: 1-800-708-7555, or *http://marketpro.com*.

July 18 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041, or *www.robertaustin.com*.

July 19 MarketPro Computer Shows & Sales. Scottish Rite Center, Sacramento. MarketPro. Contact: 1-800-708-7555, or *http://marketpro.com*.

July 19–23 Siggraph 98. Orlando, FL. Contact: *www.siggraph.org/s98/s98main.html*.

July 21–23 Teen Power Interactive '98. San Francisco. iqpc. Contact: 1-800-882-8684, or *www.iqpc.com*.

July 28–30 Marketing Automation Conference and Expo. New York, NY. DCI. Contact: (978) 470-3880, or *www.dci.com*.

July 28–30 Business Solutions And Technology Immersion Conference. New York, NY. DCI. Contact: (978) 470-3880, or *www.dci.com/datawhse*.

August

August 1 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041, or *www.robertaustin.com*.

August 8 MarketPro Computer Shows & Sales. Centre Plaza at Double Tree, Modesto. MarketPro. Contact: 1-800-708-7555, or *http://marketpro.com*.

August 8 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041, or *www.robertaustin.com*.

August 9 MarketPro Computer Shows & Sales. Civic Auditorium, Stockton. MarketPro. Contact: 1-800-708-7555, or *http://marketpro.com*.

August 14–15 Multi-Cultural Internet Conference and Expo. Los Angeles. Contact: *info@mcice.com*, or *www.mcice.com*.

August 16 MarketPro Computer Shows & Sales. Sonoma Co. Fairgrounds, Santa Rosa. MarketPro. Contact: 1-800-708-7555, or *http://marketpro.com*.

August 17–20 PERL Conference 2.0. San Jose. O'Reilly and Assoc. Contact: *http://conference.perl.com*.

August 17–20 Integrated Broadband Networks '98. Chicago, IL. Institute of Management Research Ltd. Contact: *www.broadband98.com*.

August 17–20 Training IT Conference and Expo. San Francisco. Influent Technology Group Contact: 1-888-333-9088, or *www.influent.com*.

August 17–20 SCO Forum98. San Jose. SCO Forum. Contact: 1-800-SCO-UNIX, or *www.sco.com/https/forum98*.

August 17–21 Software Development '98 Conference. Washington, D.C. Miller Freeman Contact: *www.sdexpo.com*.

August 17–21 SD 98. Washington, D.C. Miller Freeman. Contact: (781)821-6722, or *www.sdexpo.com*.

August 22 MarketPro Computer Shows & Sales. Solano Co. Fairgrounds, Vallejo. MarketPro. Contact: 1-800-708-7555, or *http://marketpro.com*.

August 22 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041, or *www.robertaustin.com*.

August 23 MarketPro Computer Shows & Sales. Solano Co. Fairgrounds, Vallejo. MarketPro. Contact: 1-800-708-7555, or *http://marketpro.com*.

August 24–26 eBusiness World. San Jose. DCI. Contact: (978)470-3880, or *www.dci.com/eBusiness*.

Classes, Seminars, Workshops

July

July 9 Internet Marketing Magic. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 9–August 20 Photoshop II (Mac)–$550. San Francisco. SFSU Downtown Multimedia Studies Prgm. Contact: (415)904-7700, or *http://msp.sfsu.edu*.

July 11 Advanced HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 11 Intro to HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 13 Internet Intensive. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 13 Intro to Word 7.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 13 Advanced Word 7.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 13–16 AutoCAD R14 — Advanced 2D Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com*, or *www.copperconn.com*.

July 14 Software and Technical Marketing in Eastern Europe. Mt. View. SimulTrans, L.L.C.. Contact: *www.simultrans.com/events.htm#schedule*.

July 14–August 18 Photoshop III (Mac)–$735. San Francisco. SFSU Downtown Multimedia Studies Prgm. Contact: (415)904-7700, or *http://msp.sfsu.edu*.

July 15 Intro to PowerPoint. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 15 Creative Multimedia Development–$525. San Francisco. SFSU Downtown Multimedia Studies Prgm. Contact: (415)904-7700, or *http://msp.sfsu.edu*.

July 15 Excel 97. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 15–August 5 Freelance and Flourish–$265. San Francisco. SFSU Downtown Multimedia Studies Prgm. Contact: (415)904-7700, or *http://msp.sfsu.edu*.

July 16–17 3D Studio VIZ for Architects–$395. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or *http://msp.sfsu.edu*.

July 16–18 Printed Circuit Fabrication and Assembly Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com*, or *www.copperconn.com*.

July 16–August 20 Director II–$575. San Francisco. SFSU Downtown Multimedia Studies Prgm. Contact: (415)904-7700, or *http://msp.sfsu.edu*.

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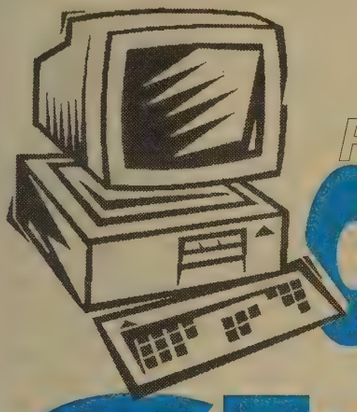

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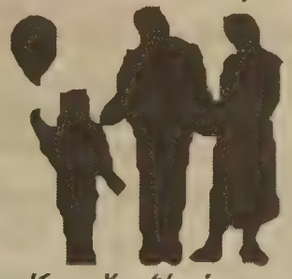

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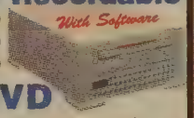

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MS Excel 97 PC	$159	PageMaker 6.5	$299
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MS Word 97 PC	$149	Freehand 8	$239
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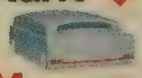

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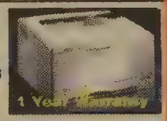

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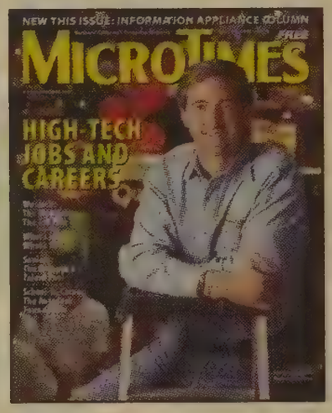
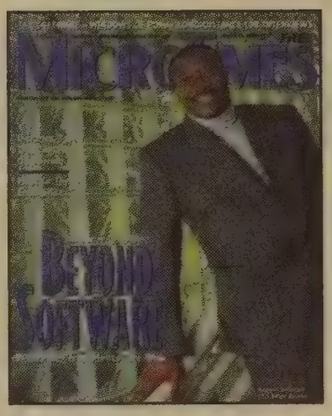


Issue #178

High-Tech Jobs/Careers

We examine the red-hot high-tech job market in this issue. Our cover story features Fred Faltersack, co-founder and CEO of Westech. Faltersack talks about his company's products and services and offers advice to job seekers. Our Editorial Assistant Sara Tassione presents a survey of hiring managers and agencies as to what's hot and how to benefit. In other stories, Peter Linde devotes his portion of the BMUG column to explaining the user group's role in your job search; also, Associate Editor Michael Robin takes a look at the School-to-Career program of the Autodesk Foundation.



Issue #177

Enterprise Computing, Intranet, Extranet

We survey the rapidly-evolving world of large-scale enterprise computing. We visit with Brian Reaves, CEO of San Jose-based Beyond Software, a startup helping Global 2000 companies make their mainframe-based legacy data legacy accessible in a Web-based environment. In related stories, Ivars Bezdechi looks at Qualcomm's intranet-based employee training program, and Peter Linde points out how, contrary to the current prevailing view, Macintosh is actually a preferable platform in the corporate environment.

Issue #176

Small Office/Home Office

We proudly present a number of stories of interest to those working in a small office, whether home-based or not. From voice recognition to OCR, new technologies are making it easier to work with your computer, and new Ethernet/ISDN networking hardware helps your office maximize its productivity. We also examine the joys of moving one's Web site and offer advice for surviving the experience.

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July 18 Internet for the Inexperienced with Netscape Navigator. San Francisco. The Learning Annex. Contact: (415)788-5500.

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July 18 PageMaker I. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

July 18 QuickBooks 5.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 19 Quark II. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

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July 20 Intro to HTML. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

July 20–23 AutoCAD R14 3D Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or *www.copperconn.com* .

July 21 Intro to Mail Merge. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 22 Microsoft Access. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 22 Access 97. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 22 Year 2000 Seminar. S. San Francisco. Ravel Software, Inc.. Contact: *www.unravel.com* .

July 22 FrameMaker. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

July 23 Free Seminar: CNE/MCSE Network Certification—Networking For Your Future. San Jose. LANOP. Contact: (408)441-9902.

July 23 Beyond Mac Basics. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

July 23–24 NT 4.0 Server–$495. San Francisco. SFSU Extended Education. Contact: (415) 904-7700, or *http://msp.sfsu.edu* .

July 24 FileMaker III. San Francisco. Media Alliance. Contact: (415)546-6491, or *www. media-alliance.org* .

July 25 Intro to HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 25 Advanced HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 25 Project Planning & Implementation–$215. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or *http://msp.sfsu.edu* .

July 25 PageMaker II. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

July 25–26 Windows 95 Super Weekend. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 26 Quark III. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

July 27 Intro to Windows 95. San Francisco. The Learning Annex. Contact: (415)788-5500.

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July 27 Intro to the IBM PC. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 27 Excel I. San Francisco. Media Alliance. Contact: (415) 546-6491, or *www.media-alliance.org* .

July 28 Databases on the WWW. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

July 28–August 18 3D Character Design–$445. San Francisco. SFSU Downtown Multimedia Studies Prgm. Contact: (415)904-7700, or *http://msp.sfsu.edu* .

July 28–August 18 Audio Engineering I–$400. San Francisco. SFSU Downtown Multimedia Studies Prgm. Contact: (415)904-7700, or *http://msp.sfsu.edu* .

July 29 PowerPoint 97. San Francisco. The Learning Annex. Contact: (415)788-5500.

July 30 Advanced Photoshop. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

July 30 Word I. San Francisco. Media Alliance. Contact: (415) 546-6491, or *www.media-alliance.org* .

July 31 Advanced HTML. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August

August 2 Photoshop Intensive. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 3 Excel II. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 3 Web Animation with FLASH. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 3–6 AutoCAD R14 Fundamentals Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or *www.copperconn.com* .

August 4 Excel 7.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 4 Free Seminar: CNE/MCSE Network Certification—Networking For Your Future. San Jose. LANOP. Contact: (408)441-9902.

August 4–7 AutoCAD Level I –$695. San Francisco. SFSU Extended Education. Contact: (415) 904-7700, or *http://msp.sfsu.edu* .

August 5 Word 97. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 6 Intro to Word 7.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 6 Advanced Word 7.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 6 Word II. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 6 Intro to HTML. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 6 Advanced Photoshop. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 7 Intro to Java. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 8 Intro to HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 8 Advanced HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 8 Mac Basics. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 10 Internet Intensive. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 10 Intro to Windows 95. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 10–13 AutoCAD R14—Advanced 2D Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or *www.copperconn.com* .

August 11–14 AutoCAD Level II–$695. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or *http://msp.sfsu.edu* .

August 12 Excel 97. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 12 Director. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 13 Photoshop Intensive. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 14 FileMaker I. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 14 QuickBooks 5.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 17 Intro to UNIX. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 17 Internet for the Inexperienced with Netscape Navigator. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 17–20 Autodesk Mechanical Desktop Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or *www.copperconn.com* .

August 18 Intro to Mail Merge. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 18 Advanced HTML. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 18 Quark I. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 19 Creative Multimedia Development–$525. San Francisco. SFSU Downtown Multimedia Studies Prgm. Contact: (415)904-7700, or *http://msp.sfsu.edu* .

August 19 Microsoft Access. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 19 Intro to PowerPoint. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 19 Access 97. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 20 Intro to Word 7.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 20 Advanced Word 7.0. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 20 Free Seminar: CNE/MCSE Network Certification—Networking For Your Future. San Jose. LANOP. Contact: (408)441-9902.

August 20 Web Design Workshop. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 20 Intro to FrontPage. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 21 FileMaker II. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 21–22 3D Studio MAX III–$395. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or *http://msp.sfsu.edu* .

August 22 Advanced HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 22 Intro to HTML. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 22 Beyond the Mac Basics. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 22 Intro to HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 23 Illustrator. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 24 Advanced UNIX. San Francisco. The Learning Annex. Contact: (415)788-5500.

August 24 PageMaker I. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

August 25 Drafting Fundamentals Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *Teach ACAD@aol.com* , or *www.copper conn.com* .

August 25 Quark II. San Francisco. Media Alliance. Contact: (415)546-6491, or *www.media-alliance.org* .

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templates that will give you a jumpstart on notes or drawings that you make routinely.

ToDo PLUS has an "at-a-glance" display mode, which shows each category with the highest priority and nearest due date. You can also view items that are due today, tomorrow, this week, next week, after that, and items with no due date.

ThoughtMill ($18) is really a combination To-Do/Memo program and is great to organize your thoughts in outline format. You can drag and drop lines anywhere in the outline. In Macintosh style, sub-hierarchy can be hidden or re-displayed and lines can be dragged to a scratch folder or trashcan. You have the option of putting Checkboxes next to lines as well. You can export and import data using Memo Pad app, with tabs indicating levels.

Trip ($20) is great for tracking automobile mileage. You can have multiple cars and of course categorize trips (e.g. business, non-profit, etc.). For each entry, you can set the beginning and ending odometer readings (or miles directly), date, time, and description. You can also set predefined descriptions.

PhoneLog ($20) is similar to Trip, but is for tracking phone calls. The app has many time saving features—for example, the call type and subject can be selected from a user-defined list. The name, company, and phone number can linked to the Pilot Address Book, and you can have it guess the entry based on what you enter. A timer can be used to set the call length. PhoneLog even shares the same models as Memo PLUS, which can be used as a starting point for attached notes, and you can export entries to the Memo Pad. If the contact is new, you can add a new Address Book entry with a simple tap. Calls can be listed by date, type, contact, and subject.

AirMiles ($30) helps you track your frequent flyer miles and avoid losing them unexpectedly. The program will categorize miles earned in a variety of ways, like phone calls, credit card usage, and lodging, as well as actual flights. Input fields include program name, date, miles, flight segments, bonus miles, expiration (life), and description (a pre-defined list can be used), and you can attach notes. Programs can have preset expiration times and bonus percentages, which can be overwritten. Mileage used can also be tracked. Entries reconciled to statements may be marked and you can export data to the Memo Pad.

So until then, keep reaching for the stars and keep those batteries charged.—*Douglas J. Nakakihara*

Resources:

Palm III, $399
3Com
http://palmpilot.3com.com

DB Explorer, $10
www2.viaweb.com/pilotgearsw/katsuhiroendo.html
www.pilotgear.com/

Digitalwriter Duo, $34.95
Cross Pen Computing Group
(401)333-1200
www.cross-pcg.com

JetPac, $19.95
J. P. Solutions
(802)254-4068
www.jpsolutions.com

AirMiles, $29.95
Memo Plus, $14.95
PhoneLog, $19.95
ThoughtMill, $17.95
ToDo Plus, $14.95
Trip, $19.95
Hands High Software
1-800-741-9070
www.handshigh.com

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text that you want to appear in the index, and then hit SHIFT-ALT-X. You hardly notice the dialog box that appears when you hit this key combination, because your entire view of the text changes.

You are shifted to a view that displays all the unprinted characters—spaces (as dots), carriage returns (as paragraph marks, a kind of reversed P) and all sorts of other debris. You are put into this view because you need to see the also-unprinted index entries as they appear. Well and good, I say, but there is no easy and obvious way to get back to the normal view.

The dialog box invites you to choose the index entry for the marked text, and any subentry that you may want to use. At least the dialog box stays open so you can mark many index entries at once, and it does move what you have selected into the "proposed entry" slot for you. But what I would like from Word is something that would automatically do all this in one keystroke.

If you're comfortable with macros, or if you read last month's column and are learning about them, you can reduce a lot of the grief by turning the whole process into a macro. Record a macro that copies the selected text, opens the indexing dialog box, pastes the selected text in, chooses to index every occurrence of it, and closes the dialog box. Then assign it to a convenient key combination, such as ALT-Z, and you can operate the macro with your left hand while selecting text with the mouse in your right hand. If you're left-handed, use "ALT-/" or something convenient on the right hand side of the keyboard.

When you are done marking text entries, go to the end of your document and select from the Insert menu the Index and Tables choice. Follow the directions to have a rather elegant index created for you.

When you're tired of looking at all the non-printing characters, go to the Tools menu, select Options and then the tab called View. There you will find that the program checked the box labeled "All" in the non-printing-characters section. Uncheck it, and your view will return to normal.

Why do we have to go through all of these steps? Well, I told you it was klutzy. But even this clumsy process is infinitely simpler than building an index by hand.

Investing In Some Learning

The bottom line here is that buying a good book and spending a few minutes with it can double the value of software you already have. You will be able to do things yourself that you thought you would have to hire someone else to do. It is well worth the time and the small cost. ◆

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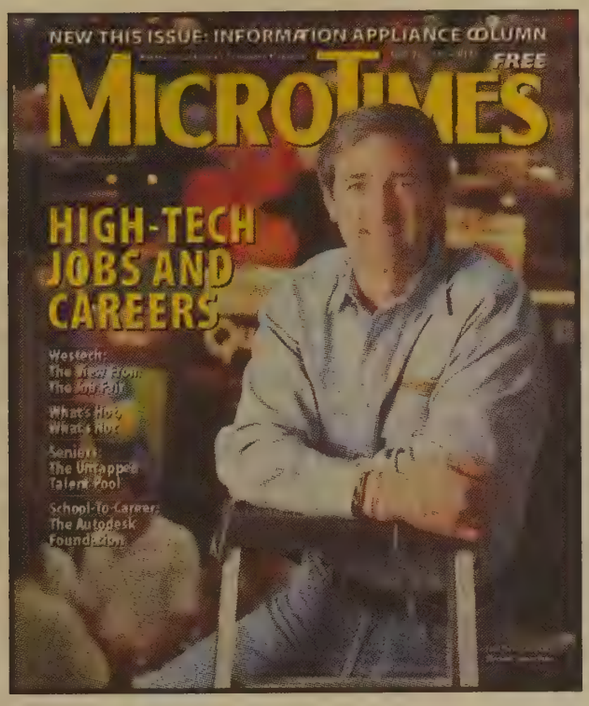
Resources:

***Visual Quickstart Guide For Word For Windows,* $15.95**
Peachpit Press
(510)548-4393
www.peachpit.com

***Microsoft Word 97 At A Glance,* $14.99**
By Jerry Joyce and Marianne Moon.
***Quick Course In Microsoft Word 97,* $14.99**
By Joyce Cox and Christina Dudley
***Step By Step Microsoft Word 97,* $29.95**
By Marie L. Swanson et al. $29.95
Microsoft Press
1-800-MSPRESS (677-7377)
http://mspress.microsoft.com/



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415

Flying High BBS. (415)468-2369. 24 hrs., 14.433.6. Totally free bbs. No upload/download ratios, no callback. Thousands of files, games, LORD, BRE, TEOS. Large adult area access w/age verification. We're back. Sysop: Jack Garner [Exp. #183]

GGCS BBS. (415)457-2516. 8-N-1, 24 hrs., 33600/2400 (limited access less than 9600 bps). Free BBS. Users helping users. Sponsored by Golden Gate Computer Society. Sysop: Doug Rainger. [Exp. #181]

510

Red Dwarf BBS. (510)261-3966. 24 hrs., 14.428.8 Wildnet, MSI SupportNet, messages, files, doors. SciFi/RPG based, but converse about far more. All welcomed. Free. Sysop: Earl Williams. [Exp. #183]

650

Kewl! BBS. (650)592-8520. Telnet: *kewl.net,* 20 nodes, worldgroup. Games featuring MajorMUD, WWW/Telnet/FTP/IRC/ , Internet email services, files, forums, chat, and more. Free trial! *www.kewl.net* .

Sysop: Squelch. [Exp. #181]

Kill-O-Byte BBS. (650)344-1563. 24 hrs., 240033,600. Online files, CD-ROMs, games, Amiga, IBM, OS/2, Windows. FREE access! [Exp. #182]

The International Academy for Peace Education B.B.S. (650)992-4274. 8-N-1, 24 hrs., Use vt100 emulation. Ethical Empirical Economics and more. Free. Sysop: Dennis McNamara. [Exp. #181]

925

Greater Light Online Worldwide. (925)754-6010, 777-3333. 24 hrs., Christian-oriented but all very welcome. All 56K. World Wide Web access only $12/month. 10-day free trial. Ready, set, G.L.O.W! Fee/free. Sysops: Michael Bryant, Beverly Reagan. [Exp. #186]

User Groups

Amiga

AWEST—Amiga Users In SF. Meetings: 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission St. (near Ocean), San Francisco. Call: (415)474-1164; BBS (415)441-1120. [Exp:#181]

TOGA—The Other Group Of Amigoids. Meetings: 4th Sat., 12:30 pm, Milpitas Community Library Meeting Room, 40 N. Milpitas Blvd., Milpitas. TOGA is an informal, non-profit group of Commodore Amiga computer users that meet to share ideas, PD software, and information. Contact: Randy Abel, (408)356-9405, or *rabel1@dsp.com* ; Warren Burnham, (408)252-3406, or *wburn46506@aol. com* ; *www.calweb.com/~rabel1* . [Exp:#185]

Atari

ABACUS—Atari Bay Area Computer Users Society. Meetings: 1st Sat., 1:00 pm, Potrero Branch Public Library, 2nd floor, 1616 20th St., San Francisco. Supporting all Atari computers and video games systems. Call: Roger Sinasohn, (415)469-7924, BBS (415)564-8062. [Exp:#183]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Main Library Estudillo Room, 300 Estudillo Ave, San Leandro. Call: Robbie, (510)797-5636. [Exp:#184]

CAD

Alternative Micro Systems, Inc. (AMS). Meetings: 1st Tues., 7:00 pm, Held at 3016 Coronado Drive, Santa Clara, CA 95054. Autodesk users group featuring tips and tricks. Meetings are open to all levels of Autodesk users from novice to expert at no charge. Contact: Elise Moss, (408)654-9500 ext. 211. [Exp:#185]

San Francisco 3D Studio User Group. Meetings: 2nd Sat., Check Web site for location, date, subject and other information. *www.sf3dsug.com* . [Exp:#183]

San Francisco AutoCAD Users Group. Meetings: 1st Mon., 6:00 pm, SFSU Downtown Center at 425 Market St. Contact: Lillian, (415)263-6748, or *www.sfaug.org* . [Exp:#183]

SVAPU—Silicon Valley Autocad Power User Group. Meetings: Quarterly 6:00 pm, Santa Clara Convention Center, 5001 Great America Pkwy., Santa Clara. RSVP/come early for free CAD seminars (starting 3 pm). Free. Contact: Tracy Rogers, (415)282.4448, or *www.power.org* . [Exp:#186]

Commodore

CHUG (Commodore Hayward User Group). Meetings: 2nd Sat., 2:00–4:00 pm, Palma Ceia Park Clubhouse, Hayward. Commodore 64 and 128 owners are welcome to attend. Call: (510)793-7868. [Exp:#183]

CWESTCommodore 64/128 Users In SF. 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission (near Ocean), San Francisco. Call: (415)474-1164; BBS (415)441-1120. [Exp:#181]

IBM And Compatibles

Armageddon LAN Gaming Group. Meetings: Meets monthly in Concord, San Jose, and Sacramento. Any and all games played over a Local Area Network with hundreds of others in the same room. Contact: Tim (510)682-0826; *www.armageddon-gaming.com* ; *mach1@armageddon-gaming.com* . [Exp:#182]

Berkeley PC Users Group—BPCUG. Meetings: 2nd Tues., 7:00 pm, Winner's Circle Systems, 2618 Telegraph Ave., Berkeley. Monthly newsletter and two SIGs at different locations—a Win95 SIG the 3rd Wed. of each month, and a Beginners SIG the 4th Tues. of each month. Contact: Mel Mann, (510)526-4033, or *melmann@aol.com* . [Exp:#185]

Diablo Valley PC User Group—DVPC. Meetings: 1st Thurs., 7:00 pm, B of A Technology Center in Lobby Conference Room, Bldg. B, 2001 Clayton Rd., Concord. SIGs include Internet, Windows, Beginner's, Visual Basic, education/entertainment, and more. Call: Craig Peterson, (510)556-1449, *bod@dvpc.org* , or *www.dvpc.org* . [Exp:#184]

East Bay FOG. Meetings: 2nd Wed., 7:30 pm, Episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Oakland. All microcomputers, MS-DOS, CP/M. Call: (510)653-2627, 8–10 pm. [Exp:#185]

Golden Gate Computer Society. Meetings: 4th Mon., 7:00 pm, San Rafael Community Center, 618 B St., San Rafael. Free intro to computers class at 6:00 pm. Call: (415)454-5556, or *www.ggcs.org* . [Exp:#185]

Nybblers Computer Club Meetings: 3rd Fri., 8:00 pm, Prado Internet Access, 1260 A St., Hayward. PC and TRS-80. Contact: For info write *Nybblers@aol.com* , or *www.members.aol.com/Nybblers* . [Exp:#181]

PC Clubhouse. Meetings: 1st Fri., 7:30 pm, swap at 7:00 pm, CSU Hayward, Meiklejohn Hall, Room 2002. Learn more about your computer. Product demos. Member help. Call: (510)538-2449, (510)276-6450, or *www.pcc.org* . [Exp:#182]

Peninsula Computer Club. Meetings: 2nd Thurs., 7:30 pm, 222 Laurel St., San Carlos. DOS and CP/M libraries. Call: (650)593-9981, BBS (650)571-9259, or *larryw3553@aol.com* . [Exp:#183]

San Francisco Bay Area Powerbuilder Users Group (SFBPUG). Meetings: 3rd Thurs., San Francisco. Please check our Web site at *www.sfbpug.org* for location details. Contact: Craig Orr at *crbare@redshift.com* [Exp:#183]

San Francisco PC Users Group. Meetings: 3rd Tues., 7:30 pm, PUC Auditorium, 505 Van Ness Ave./McAllister. Presentations, Q&A sessions. Call: Pierre Hahn, (415)474-1587 or 777-1332 for recorded events message, *www.sfpcug.org* . [Exp:#181]

Stanford Palo Alto Users Group for PCs (SPAUG). Meetings: Last Weds., 7:00 pm, Palo Alto Elks Club, 4249 El Camino, Palo Alto. Contact: Jim Dinkey (650)493-9307 . [Exp:#186]

User Groups

Macintosh

A32. Meetings: 2nd Sat., 10:00 am, Strawberry Square clubhouse, 530 Strawberry Lane, San Jose (off Moorpark, between Lawrence and Saratoga). Product demos, and Q&A sessions. Contact: (408) 881-0790, or *www.batnet.com/rlbrown/A32.html* . [Exp:#181]

BMUG User Group. Meetings: every Thurs., 6:30 pm, BMUG, 2070 Allston Way (basement level), Berkeley. Q&A, vendor demo and raffle. Free. Contact: (510)549-2684, or *www.bmug.com* . [Exp:#184]

Macs Of Marin. Meetings:Last Wed., 8:00 pm, Corte Madera Rec. Ctr., 498 Tamalpais Dr., Marin. Q&A at 8:00, members free, non-members $5. Call: Richard, (415)485-5596. [Exp:#185]

P.I.E. Macintosh Special Interest Group. Meetings: 3rd Wed., 7:00 pm, Cypress Senior Center, Rm. 4 entry thru Room 3 San Jose. Email at *frnmrn@juno.com* . Call: Frank A Arnerich, (408)244-4034, or *www.juno.com* . [Exp:#184]

Peninsula Apple Users Group—PAUG. Meetings: 3rd Tues., 6:30 pm, at the Unitarian Church, 2124 Brewster Ave. (at Lowell, use side entrance), Redwood City. Newsletter, speakers, software demos, DOM, Q & A, library. Contact: Roger Lakner, (650)367-8657, or *www.wwinfocenter.com/PAUG/* . [Exp:#184]

Miscellaneous

BayCHI. Meetings: 2nd Tues., 7:30 pm, Xerox PARC Auditorium, 3333 Coyote Hill Rd., Palo Alto. Computer-Human Interaction Group. Free and open to the public. Contact: Infoline (408)235-9422, or *www.baychi.org* . [Exp:#181]

DIG.FM—FileMaker Developer Interest Group. Meetings: 3rd Wed., 7:00 pm, FileMaker Inc., 5201 Partick Henry Dr., Santa Clara. Everyone is welcome. Each meeting consists of presentations followed by smaller interest group sessions. Contact: Dave Nicely, (510)526-3744. [Exp:#184]

MS Access Peninsula User Group. Meetings: 2nd Fri., 1:00 pm, Metro Center Building, 9th floor, Foster City. All welcome from beginners to professionals. Contact: *www.rampage.net/accdocs/sigs/htm* . [Exp:#181]

North Bay Users Group—NBUG. Meetings: 2nd Thurs., 7:30 pm, 330 Rodgers St., Vallejo. Open to all. Contact: Lolly, (707)645-8768, or *www.home.inreach.com/nbug* . [Exp:#181]

San Francisco Business Computers. Meetings: For people who use computers in their work. All makes, models, and software welcome. Contact: Jordan Rosenberg, *sfbc@juno.com* . [Exp:#185]

Silicon Valley Clarion User Group. Meetings: 2nd Weds., 7:00 pm, San Jose. Contact: Don Wood, *www.desine.com/svcug* . [Exp:#181]

Networking

EBNUG (East Bay Netware User Group). Meetings: 3rd Thurs., 6:30 pm, at EBMUD, 375 11th St., Oakland. Contact: Andy Zutler at *azutler@radiolan.com* . [Exp:#184]

Novell

Novell Users Group of Monterey/Salinas/Santa Cruz. Meetings: 3rd Thurs., 6:30 pm, 40 Ragsdale Dr., (Ryan Ranch), Monterey. Membership: $25/year, or $5/meeting. Contact: *jspencer@jps.net.* [Exp:#182]

Programming

Languages Java SIG of the Software Forum. Meetings: 1st Tues., 7:00 pm, Cubberly Community Ctr., 4000 Middlefield Rd., Rm. H-1, Palo Alto. Free to members, $10 for non-members. Contact: Tom Hill, *javasig@worldware.com* . [Exp:#181]

Texas Instruments

TI-99/4A. Meetings: 2nd Sat., Oakland. Need programs/hardware? Call: Fred, (510)530-8335. [Exp:#184]

UNIX

Bay Area FreeBSD Users Group (BAFUG). Meetings: 2nd Thurs., 7:30 pm, San Francisco and Redwood City. See Web site for directions and updated times and locations. Free and open to all interested in FreeBSD, UNIX, and OpenSources. Refreshments are provided. Meetings are free. Contact: *www.freebsd.org* , *www.arachna.com/freebsd/freebsd-sf.html* , or *spidaman@arachna.com* . [Exp:#184]

City College of San Francisco Linux Users Group. Meetings: Every Thurs., 3:00 pm, CCSF Student Union, MLK Center, 50 Phelan Ave., San Francisco. Free and open to all interested in Linux and/or UNIX. Contact: Jennifer Hauck (415)239-3108, or *jhauck01@ccsf.cc.ca.us* . [Exp:#186]

San Francisco Bay Area FreeBSD User Group. Meetings: 7:30 pm, This group serves the needs of the San Francisco Bay Area FreeBSD user base and holds meetings approximately once a month. Please see Web page for details. Contact: *www.arachna.com/freebsd/freebsd-sf.html* . [Exp:#182]

Windows

Bay Area Windows NT User Group. Meetings: 1st Sat., 1:00 pm, San Francisco and Cupertino, see Web site for times and locations. This professional association is for NT systems administrators and developers. Contact: Edwin Rutsch, (510)528-9895, *edwin@wyp.net* , or *www.bantug.org* . [Exp:#181]

Central California Windows NT Users Group. Meetings: 1st Sat., 10:00 am, Oakhurst. Contact: Robert Slovick, (209) 683-1499, or *www.inetassist.com/ntug* . [Exp:#181]

NT Bay Area NT Users Group (BANTUG). Meetings: 2nd Weds., 6:30 pm, Teknowlogy Education Ctr., 50 California St. Ste. 1600, San Francisco. Refreshments are provided. Meetings are free. Contact: Edwin Rutsch, (510)528-9895, *edwin@wyp.net,* or *www.bantug.org* . [Exp:#181]

Associations

Access SIG of the Association of Database Developers (ADD). Meetings: 2nd Weds., 7:00 pm, 225 Bush St., 3rd Fl., San Francisco. Contact: Paula Payne, *pmp@outformations.com* . [Exp:#186]

Association of Database Developers (ADD). Meetings: 7:00 pm, DesignMind, Inc. 124 Beale St., Mezzaine Level. San Francisco. Contact: Barbara Paltiel (415)538-8484, *ADD@designmind.com* , or *www.baadd.org* . [Exp:#186]

CoCo 2000. Meetings: 2nd Tues., 6:00 pm, Contra Costa Year 2000 User Group meets at OASys Network Solutions, 1855 Gateway Blvd., 7th Fl., Concord. Free and open to all. Contact: John Cascio (925)685-6279, or *jcascio@oasys-cs.com* . [Exp:#185]

FoxVFP SIG of the Association of Database Developers (ADD). Meetings: 1st Thurs., 7:00 pm, 225 Bush St., 3rd Fl., San Francisco. Contact: Dean Lesner (415)788-4366, *dlesner123@aol.com* . [Exp:#186]

ICCA Silicon Valley. Meetings: 4th Tues., 6:00 pm, Hobbee's Restaurant, 920 Town and Country Village (Stevens Creek/across from Valley Fair Mall), San Jose. Regularly-scheduled dinner meetings, $25 non-members/$20 members. Contact: Paul Stith, (408)439-0870, ext 2, *info@icca-sv.org* , or *www.icca-sv.org* . [Exp:#182]

Internet SIG of the Association of Database Developers (ADD). Meetings: 3rd Tues., 7:00 pm, 225 Bush St., 3rd Fl., San Francisco. Contact: Patrick Lynch, (510) 482-5329, *patl@a.crl.com* , or *www.rampros.com* . [Exp:#186]

Java SIG of the Association of Database Developers (ADD). Meetings: 4th Tues., 7:00 pm, 225 Bush St., 3rd Fl., San Francisco. Contact: Paula Payne, *pmp@outformations.com* . [Exp:#186]

San Francisco Association of Internet Professionals—AIP-SF. Meetings: 1st Tues., 6:00 pm, Transmission Theater, 314 11th St. (near Folsom) in the SOMA part of San Francisco. A membership- and chapter-driven organization with the ability to unify, support, and represent the global community of Internet professionals. See Web site for meeting times/location. Contact: Jeff Ward, (408)899-2011, *jward@association.org* , or *www.association.org* . [Exp:#181]

San Francisco Web Business Mixer. Meetings: 2nd Weds., San Francisco. A monthly after work mixer and networking event for people in the business of Web publishing, design, advertising, marketing, and commerce. $5.00 gets you table space and T1 access. Bring your business cards, brochures and URLs! Contact: Details on the monthly featured speakers are always at *www.webmixer.com* . [Exp:#183]

Society For Technical Communication, San Francisco Chapter. Meetings: 3rd Wed., 6:00 pm, London Wine Bar, 415 Sansome St., San Francisco. For technical writers and editors. Newsletter, annual competition. Non-members, $12. Contact: (415) 561-9204, or *http://stc.org/region8/sfc/www* . [Exp:#186]

The Software Forum. Meetings: 3rd Wed., 6:00 pm, Michaels at Shoreline, San Francisco. Call ahead to reserve a place. Contact: Kim Murray (650) 854-8298, or *www.softwareforum.org* . [Exp:#181]

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350BX	$1668
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- 36X Speed Internal ATAPI IDE CD-ROM
- Sound Blaster 64 PCI Sound Card
- Intel I740 AGP 8MB SGRAM Video Card (DVD ready)
- 17" ShamRock SVGA Digital Power-Saving Monitor
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400MHz	$2411	$3181
450MHz	$2637	$3632

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New Intel 440BX chipset for 350MHz and 400MHz CPUs requires 100MHz PC100 DIMM memory

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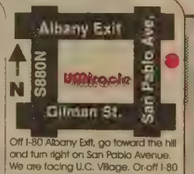

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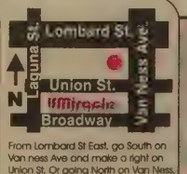

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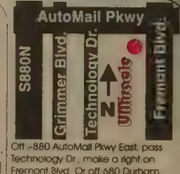

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Looking a month down the road and into August or September this year, we can expect motherboards with Intel's new slot 2 CPUs to be on the market. The Slot 2 CPUs will offer an amazing performance increase over Slot 1 PII cpus, and they will be targeted only to the high end market like servers and high end workstations. The main chipset for these high end CPUs will be the 450NX chipset. It's interesting though, that Slot 2 CPUs will also work with the BX chipset. Slot 2 will only come with 100 MHz front side bus that also requires 100MHz PC100 DIMM.

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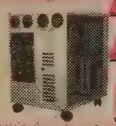

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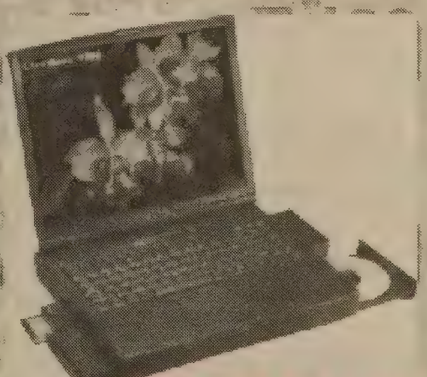

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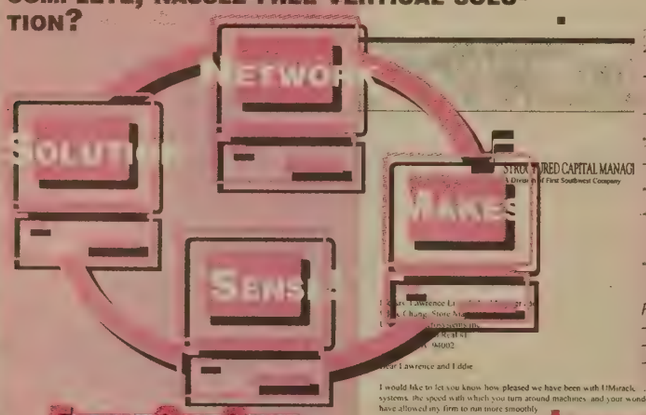

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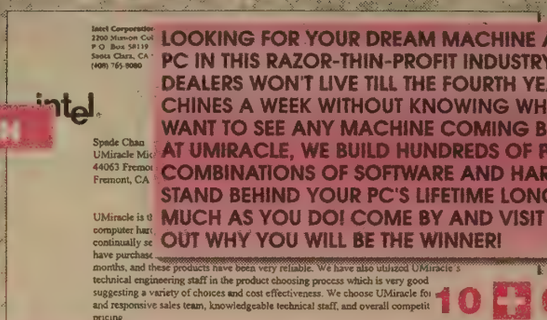
LOOKING FOR YOUR DREAM MACHINE AT THE CHEAPEST PRICE? SHOPPING FOR A PC IN THIS RAZOR-THIN-PROFIT INDUSTRY IS DANGEROUS BECAUSE 70% OF THE DEALERS WON'T LIVE TILL THE FOURTH YEAR IN BUSINESS, MOST SELL 3 OR 4 MACHINES A WEEK WITHOUT KNOWING WHAT THEY ARE SELLING AND 99% DON'T WANT TO SEE ANY MACHINE COMING BACK AFTER YOU WALK OUT OF THE DOOR. AT UMIRACLE, WE BUILD HUNDREDS OF PC'S EVERY WEEK, WE TEST EVERY POSSIBLE COMBINATIONS OF SOFTWARE AND HARDWARE FOR COMPATIBILITY, AND WE STAND BEHIND YOUR PC'S LIFETIME LONG! WHY? BECAUSE WE LOVE YOUR PC AS MUCH AS YOU DO! COME BY AND VISIT ONE OF OUR STORES AND YOU WILL FIND OUT WHY YOU WILL BE THE WINNER!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technical engineering staff in the product choosing process which is very good
suggesting a variety of choices and cost effectiveness. We choose UMiracle fo
and responsive sales team, knowledgeable technical staff, and overall competit
pricing.

10 + ONE NETWORK SOLUTION

- *TEN PCChips AMD-K6 233MHz WorkStations w/Licensed Windows 98 (10x$689)*
- *ONE Intel Atlanta AL440LX Pentium II File Server w/ 266MHz CPU ($1271+525+700) w/25 User Licensed NT4.0 Server* (See Previous Pages for Workstations and Server Configuration Details)
- *ELEVEN Intel EtherExpress 100BaseT PCI Network Interface Adapters Installed (11x$59)*
- *HP LaserJet 4000N Printer w/10BaseT Connection to Server ($1440)*
- *3COM 3C250B-TX 12-Port SuperStackII 100BaseT Stackable Hub ($1115)*
- *APC Smart-UPS 420Net Un-interruptable Power Supply w/ Setup ($240)*
- *Up to 1100' Catalog5 100BaseT UTP Cabling (InWall w/ Plates - 11 Nodes) (11x$60)*
- *OnSite Windows NT WorkGroup Network Resources and Printer Setup (11x$60)*

Recommended Options:
- *Internet Access + EMail Solution*
- *Disaster Recovery Backup Solution*
- *Fax Server Solution*
- *Network User + Administrator Training*
- *3 Month 24-Hour Response Service Maintainence Contract*

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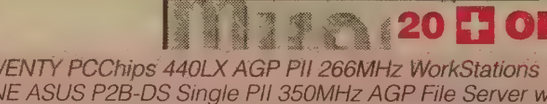

20 + ONE NETWORK SOLUTION

- *TWENTY PCChips 440LX AGP PII 266MHz WorkStations w/Licensed Win98 (20x$950)*
- *ONE ASUS P2B-DS Single PII 350MHz AGP File Server w/25 User Licensed NT4.0 Server ($4030) with Dual 100BaseT PCI NICs each connected to 100BaseT hub for double thoroughput* (See Previous Pages for Workstations and Server Configuration Details)
- *TWENTY-TWO Intel EtherExpress 100BaseT PCL Network Interface Adapters Installed ($1298)*
- *HP LaserJet 4000N Printer w/10BaseT Connection to Server ($1440)*
- *TWO -3COM 3C250B-TX 12-Port SuperStackII 100BaseT Stackable Hubs ($2230)*
- *APC Smart-UPS 620Net Un-interruptable Power Supply w/ Setup ($300)*
- *Up to 2100' Cat5 100BaseT UTP Cabling (InWall w/ Plates - 21 Nodes) (21x$60)*
- *OnSite Windows NT WorkGroup Network Printer and Resources Setup (21x$60)*

Recommended Options:
- *Internet Access + EMail Solution*
- *Disaster Recovery Backup Solution*
- *Fax Server Solution*
- *Network User + Administrator Training*
- *6 Month 24-Hour Response Service Maintainence Contract*

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40 + ONE NETWORK SOLUTION

- *FORTY Intel Seattle SE440BX Pentium II 350MHz WorkStations w/Licensed Win98 (40x$$1668)*
- *ONE Intel N440BX Dual Pentium II 400MHz File Server w/45 User Licensed NT4.0 Server ($6446)* (See Previous Pages for Workstations and Server Configuration Details)
- *FORTY Intel EtherExpress 100BaseT PCI Network Interface Adapters Installed (40x$59)*
- *ONE HP LaserJet 5SiMX 100Kpage Monthly DutyCycle •Network Printer ($3580)*
- *FOUR 3COM 3C250B-TX 12-Port SuperStackII 100BaseT Stackable Hubs (4x$1115)*
- *APC Smart-UPS 1000Net Un-interruptable Power Supply w/ Setup ($480)*
- *Up to 4100' Catalog5 100BaseT UTP Cabling (41x$60) (InWall w/ Plates - 41 Nodes plus Wiring Rack)*
- *OnSite Windows NT WorkGroup Network Printer & Resources Setup (41x$60)*

Recommended Options:
- *Internet Access + EMail Solution*
- *Disaster Recovery Backup Solution*
- *Fax Server Solution*
- *Network User + Administrator Training*
- *12 Month 24-Hour Response Service Maintainence Contract*

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STRUCTURED CAPITAL MANAGE
Dear Lawrence and Eddie
I would like to let you know how pleased we have been with UMirack
systems, the speed with which you turn around machines and your wonderful service and repair operation
have allowed my firm to run more smoothly.
My firm is an investment banking firm and
reliability of our systems is very important
low prices as well. Also the knowledge th
Thanks again for your incredible service a
your boss of the good work you are doing.
Sincerely,
Gregory J. Reitte
Vice President

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INTERNET PROVIDES POWER TO BUSINESS USERS LIKE YOU! EXPLORING YOUR IDEA, GO TO INTERNET! RESEARCHING YOUR PROJECT, GO TO INTERNET! MAKING AN INTERNATIONAL CALL, GO TO INTERNET! ONCE YOU HAVE IT, YOU WILL HOOK ON IT. AND TO HOOK ON IT CHEAP, YOU NEED ISDN INTERNET ACCESS FROM UMIRACLE. WE WILL SETUP YOUR ISDN LINE, GET YOU THE RIGHT ROUTER, SETUP YOUR ISP ACCESS ACCOUNT, SETUP YOUR EMAIL ADDRESSES, CONFIGURE YOUR NETWORK WITH TCPIP PROCOTOL, ALL FOR ONE PACKAGE PRICE! PLEASE CALL 1888-NET-OKAY x 161 FOR DETAILS! (SOFTWARE+HARDWARE+ISP+SETUP LABOR)

FAX SERVER SOLUTION

DON'T WAIT IN LINE FOR YOUR TURN TO FAX, DON'T HAND-WRITE YOUR COVER PAGE! FAX DIRECTLY FROM YOUR DESKTOP, NEATLY AND PROFESSIONALLY! WITH THE RIGHT FAX SOLUTION, YOU CAN RECEIVE YOUR FAX AND PRINT RIGHT TO YOUR LASER PRINTER, REPRINT YOUR 6 MONTHS OLD FAX, FAX YOUR DOCUMENTS FROM YOUR WINDOWS APPLICATION JUST LIKE PRINTING. ALL VIA ONE LINE, ONE MODEM! FORGET ABOUT BRINGING A LINE AND A MODEM TO EVERY DESKTOP! WITH SOPHISTICATED FAX SERVER SOFTWARE AND UMIRACLE NETWORK SOLUTION TECHNICAL EXPERTISE, WE SURE CAN GET YOU THE BEST SOLUTION! PLEASE CALL 1888-NET-OKAY x 161 FOR DETAILS! (SOFTWARE+HARDWARE+SETUP LABOR)

DISASTER RECOVERY BACKUP SOLUTION

YOU THINK YOU GOT IT ALL BACKED UP? NOT UNTIL THE DAY YOUR SERVER CRASHES YOU WILL FIND OUT YOU HAVE TO 1.) TROUBLESHOOT AND REPLACE YOUR DEFECTIVE COMPONENTS, 2.) RELOAD YOUR NOS, DRIVERS, APPLICATIONS AND BACKUP SOFTWARE, 3.)RESTORE YOUR DATA FILES FROM BACKUP, 4.)RECONSTRUCT YOUR USER AND PRINTER ACCOUNTS, AND 5.)EXPECT MISSING AND CORRUPTED DATA HERE AND THERE! WHY? BECAUSE YOUR BACKUP SOFTWARE BACKS UP ONLY DATA FILES, NOT THE OPENED FILES, NOT THE SECURITY DATABASE NOR THE PARTITION INFORMATION! BACKUP SOFTWARE DON'T MAKE SENSE UNTIL NOW! WITH REPLICA V3 BY STAC, YOU CAN BACKUP YOUR HARDDRIVE PARTITIONS AS OBJECTS, RESCUE YOUR DISASTER WITH A REBOOT FROM A RECOVERY DISK, EVEN FROM A LOW-LEVEL-FORMATED HARDDRIVE, AND BRING YOUR SERVER UP IN HOURS! TO FIND OUT HOW WE CAN PROVIDE THIS SOLUTION, PLEASE CALL 1888-NET-OKAY x 161 FOR DETAILS! (SOFTWARE+HARDWARE+SETUP LABOR)

WE MONITOR THE TRENDS OF EVERY TECHNOLOGY IN THE INDUSTRY AND GET YOU THE BEST GUARANTEE WE WILL TAKE IT BACK IF IT DOESN'T WORK!

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SAN FRANCISCO STORE GRAND OPENING!

Motherboard without CPU: (Call for CPU Price)

PCCHIPS M571 SIS TXPro-II Pentium Motherboard 512K Cache- onbrd. Sound Pro Audio, 72+168pin Dimm, Onbrd VGA sharing main board memory (upto 4MB), High-Spd I/O, FD, IDE, AT Format $105

PCCHIPS M577 SIS TXPro-AGP Super Socket 7 Pentium Motherboard 1MB Cache onbrd Sound Pro Audio, 72+168pin Dimm, Support AMD-K6-2, Cyrix MII300+above, 100MHz FSBus, High-Spd I/O, FD, IDE, AT Format .. $95

PCCHIPS M715 440LX Chipset Pentium II Motherboard - onbrd Sound Pro Audio, 72+168pin Dimm, bundled with 4MB AGP SIS Video card High-Spd I/O, FD, IDE, AT Format $140

EURONIC MS7060S i440BX Pentium II ATX Motherboard with AGP Port and Yamaha Sound onboard supporting 100MHz Bus upto 450MHz, High-Spd I/O, FD, UDMA IDE ATX Format $145

ASUS TX97(L) 430TX Chipset, 512K, Pentium/AMD CPUs, 4 PCI+4 ISA, 168Pin DIMMx3, onbrd UIDE, I/O, AT form factor $115

ASUS TX97-E(L) same as TX97 w/168Pin DIMMx2+72PinSIMMx4 support . $115

ASUS TX97-X(L) same as TX97 w/CreativeLabs Audio, ATX form factor .. $155

ASUS TX97-XE(L) same as TX97-X w/•DIMMx2+72PinSIMMx4 supt $160

ASUS P2L97 Intel Pentium II motherboard - 233-333Mhz support, 440LX AGPset, 5 PCI/2 ISA/1 AGP slots, DIMM, Onbrd I/O, UltraDMA PCI IDE, ATX format $125

ASUS P2L97-S same as P2L97, plus onbrd Adaptec 7880 U-Wide SCSI ... $235

ASUS P2L97-DS same as P2L97, plus onbrd Adaptec 7880 U-Wide SCSI and Dual Pentium II CPU support $355

ASUS P2B/• Intel Pentium II BX chipset motherboard - 233-333Mhz support, 440LX AGPset, 5 PCI/2 ISA/1 AGP slots, DIMM, Onbrd I/O, UltraDMA PCI IDE, ATX format $165

ASUS P2BD/P2B-S/P2B-L/P2B-LS/P2B-DS BX Chipset Boards ..... $335/$315/$245/$360/$455

Intel Atlanta AL440LX Pentium II Motherboard - 233Mhz & above CPU support, 440LX AGPset, Yamaha OPL4 Audio, 3 PCI/2 ISA/1 AGP slots, DIMM, I/O, UltraDMA PCI IDE, ATX format $160

Intel Dakota DK440LX Dual Pentium II Motherboard - 233Mhz & above Dual CPU support, 440LX AGPset, 4 DIMM slots, Onbrd I/O, UDMA PCI IDE, onbrd Intel Pro100BT Ethernet and Adaptec 7895 Dual SCSI w/RAIDport $495

Intel Seattle SE440BX Chipset 66MHz/100MHz FrontSide Bus Pentium II Motherboard supporting 350MHz (100x3.5), 400MHz (100x4) newest PII CPUs , AGP, Crystal Full-Duplex 16bit Sound, 2 ISA/4 PCI/AGP slots, 3 DIMM Slots upto 384MB, I/O, U-DMA PCI IDE, ATX format $215

Intel N440BX NightShade Server Platform Pentium II 100MHzBus BX Motherboard support upto 400MHz-PII - Dual PII CPU support, 4 DIMM (ECC 72Bit SDRAM) slots, Onbrd f/O, UltraDMA PCI IDE, onbrd Intel Pro+ 100BT Ethernet, Symbios Logic 53C876 Dual Chanel UW SCSI port w/ Zero-Channel Raid support, 2MB onbrd CL-GD5480 PCI VGA, Hardware Server Mgmt, and LANDesk Server Manager Software for NT and Netware . $680

CPU & Memory: (Prices Subject To Change without notice)

Intel Pentium® II processor 233MHz/266MHz/300/333MHz 512KCache .. $Call

Intel Pentium® II Deschutes (100MHz Bus) processor 350/400/450MHz for use with BX chipset motherboard only ..... $Call

Intel Pentium® II Celeron Pentium II 266/300MHz based processor ..... $Call

Pentium® 166/200/233MHz MMX CPU ..... $Call

AMD K5/K6/K6-2/Cyrix® MII CPU ..... $Call

72Pin SIMM /168Pin DIMM/SDRAM/EDO/ECC/EEPROM ..... $Call

168Pin DIMM 100MHz Bus for BX Chipset 32M/64M/128M ..... $Call

I/O Card/Controller Card:

Adaptec 2940U Ultra SCSI/2940UW SCSI Controller ..... $145/$175

Adaptec NEW 2940U2W Ultra2 SCSI PCI Controller $350

Adaptec AAA-131/AAA-133 RAID 5 Ultra-Wide SCSI-2 Multi-Channel Host Adaptor w/1MB Cache onbrd ..... $345/$540

Diamond Fireport 40 UW-SCSI PCI Controller Single/Dual Channel . $130/$170

Network Card:

Ethernet NE2000 ISA PnP/Softset 16Bit Combo/PCI Combo ..... $20/$25

Intel EtherExpress Pro 10/100 PCI ENET 32Bit 10-BT $59

3COM Etherlink III 3C509B Combo $65

3COM Etherlink XL 3C900 Parallel-Tasking PCI Combo $75

3COM Fast Etherlink XL 3C905-TX Parallel-Tasking 100BT PCI $65

Video Card:

Trident 9685 Windows Accelerator PCI 2MB $35

SIS Chipset 3DPro AGP 4MB EDO Video Card $45

Intel i740 Chipset 8MB x2 AGP Video Card $75

ATI All-In-Wonder PRO - PCI 4MB/8MB AGP 4MB/8MB $205/265/205/265

ATI Xpert@Work OEM - PCI 4MB/8MB AGP 4MB/8MB $115/163/115/163

ATI Xpert@Play OEM - PCI 4MB/8MB AGP 4MB/8MB $125/170/125/170

ATI 4MB memory upgrade for All-in-Wonder/@Work,@Play $40

Matrox MGA Millennium II WRAM AGP/PCI 4MB/8MB ..... $125/$195

Memory module for Millennium II 4MB/8MB/12MB ..... $85/$170/$235

Matrox MGA Mystique 220 2MB/4MB SGRAM OEM AGP/PCI $70/95

Maxtrox Productiva G100A SDRAM AGP 8MB $89

Matrox Millenium G200/Mystique G200 AGP ..... $Call

Diamond Stealth 3D 2000 Pro PCI 2MB/4MB EDO DRAM ..... $50/$65

Diamond Stealth 3D 4000 AGP 2MB/4MB SGRAM ..... $65/$79

Diamond VIPER V330 PCI/AGP 4MB SGRAM $95

Diamond FIRE GL1000 Pro 4/8MB, 2/3DLabs Permedia2 Chpst .... $130/$170

Diamond Monster 3D II 12MB 3D Accelerator $270

Creative Labs 3D Blaster VooDoo2 12MB 3D Accelerator $270

Monitor:

14" ShamRock 1Kx768NIx0.28DP Digital Control Pwr-Saving Monitor $230

15"/17" ShamRock 1280x1KNIx0.28DP Monitor ..... $145/$295

Hitachi NSA SuperScan Pro CM-500U 15" .28DP,1280x1024 ..... $215

Hitachi NSA SuperScan Pro CM-620U 17" .28DP,1280x1024 ..... $385

Hitachi NSA SuperScan Elite CM-630U 17" .22DP,1600x1280x69Hz $485

Hitachi NSA SuperScan Elite CM-751U 19" .22DP,1600x1280x75Hz $765

Hitachi NSA SuperScan Supreme CM-752U 19" .22DP,1.6kx1.2k@80Hz .. $810

Hitachi NSA SuperScan Pro 800 21" .22DP,1600x1200x75Hz $965

Hitachi NSA SuperScan Elite 802/802Plus 21" .22DP,1600x1280 .. $1240/$1340

Hitachi NSA SuperScan Supreme 803 21" .22DP,1800x1440 77Hz $1520

IIYAMA VisionMaster-17 MF-8617E 17" $460

IIYAMA VisionMaster-Pro 17 MT-9017E 17" Diamondtron Tube $525

IIYAMA VisionMaster 450 S-901GT 19" $675

IIYAMA VisionMaster-Pro 501 A-101GT 21", Diamondtron 1600X1200 ... $1035

IIYAMA VisionMaster-Pro 502 A-102GT 21", Diamondtron 1800X1440 ... $1085

NEC A500/E500/A700/E700 ..... $233/$330/$444/$554

Sony 15"-100ES/100GS 17"-200ES/200GS/200PS 19"-400PS 21"-500PS ..... $299/$349/$565/$635/$789/$989/$1649

Viewsonic E641/E655/15GA/15GS/17EA/17GA/17PS/PT770/PT775/GT770/G800/G810/PT813/G810/GT800/29GA/P810/P815/etc ..... $Call

Modem:

Phoebe V.90/K56Flex Dual Mode PCI Windows Voice Fax/Modem $45

Diamond Supra Max 56K V.90 internal PCI Fax Voice modem $60

USR Sportster 56K V.90 Faxmodem Internal/External ..... $133/$151

USR Sportster 56K V.90 Voice Faxmodem Internal/External ..... $153/$168

Floppy Drive Tape Backup:

Floppy Drive 1.44M 3.5"/Teac 1.2M 5.25"/1.44M 3.5" ..... $20/$45/23

Colorado 3.2GB T-3000 off floppy Travan w/Win95 Sftwre, w/tape $155

Colorado HP T4i 8GB, 62MB/min, SCSI-2, Travan TR-4, int., w/tape $350

Colorado HP 5GB, IDE, 648K/s, 55MB/min, 2.5Gb native/5GB compressed, Travan TR-4, int., w/tape $195

Colorado HP 5GB Travan Tape 1pack/2pack/5pack ..... $26/$50/$120

Colorado HP 8GB, IDE, 648K/s 45-70MB/min, 4Gb native/8GB compressed Travan TR-4, int., w/tape $250

A:Drive LS-120MB Super FDrive 5X1.44FD spd, read/write 1.44MB $115

ZIP Drive 100MB w/disk ATAPI IDE -Internal $85

ZIP Drive 100MB w/disk SCSI-Internal/External ..... $115/$130

Iomega ZIP PLUS Drive 100MB w/disk SCSI /Parallel External $185

Iomega ZIP Disks single/three/six/ten pack ..... $17/$41/$75/$110

Iomega Jaz 1GB w/disk SCSI-Internal/External ..... $250/$270

Iomega Jaz 1GB Disks single/three pack ..... $112/$266

Iomega Jaz 2GB w/disk SCSI-Internal/External ..... $440/$440

Iomega Jaz 2GB Disks single/three pack ..... $146/$385

Tape Cartridge (1/2/5pack) TR1/3/4 . ($24/46/112)($31/60/149)($35/68/167)

4mm DAT tape DDS1-90M/DDS2-120M/DDS3-125M ..... $6/$12/$24

Keyboard/Mice:

104 Enhanced Win95 Keyboard $12

KeyTronic 104 Enhanced Win95 Keyboard $21

Focus 2001 104 Win95 Key Enhanced Click w/Cover $33

Natural Keyboard SK-6000 Win95 Key Enhanced/with Touch Pad ... $30/$49

MicroSoft Natural ELITE OEM Keyboard V2.0 for Win95/NT $53

MicroSoft Intellimouse with Wheel Serial/PS2 (with System ONLY) $25

Logitech FirstMousePlus with Wheel Serial/PS2 ..... $18

Logitech MousemanPlus 4 Button with Thumb+Wheel Serial/PS2 ..... $52

Logitech Cordless MousemanPro Serial/PS2 ..... $52

Logitech Trackman Marble/Trackman Marble FX Serial/PS2 ..... $48/$84

Software:

MS DOS 6.22/Windows V3.11/WFWG V3.11(w/System) $45/55/75

MS Windows 95 CD OSR2.5 /NT V4.0 Workstation w/IE4(w/System) $125/$180

MS Windows 98 CD OEM w/IE4(w/System) $125

MS Windows NT V4.0 Server with 5 User/25User License OEM $650/1350

MS BackOffice Small Business Server 4.0 with 5 Access License OEM .. $1280

MS Office 97 Small Business Ed./Professional Ed. ..... $199/$510

MS HomeEssential 98 - Word97/Works 97/Money98/Encarta98 Encycopedia Std/Greeting Workshop/InternetExplorer3.02 ..... $95

Chassis/PowerSupply/Misc:

ATX Mid Tower Chassis with 230W ATX Power Supply $50

ATX Medium/Full Tower Chassis with 250W ATX Power Supply ..... $70/$89

Mini-Med Tower/Med/Full/DeskTop with 230W AT PS ..... $30/$55/$80/$40

Server Enclosure KS-1400 w/ Dual Redundant Hot-Swappable 300Wx2 PowerSupply, Full-size AT, Baby AT, oversize AT based boards, 14-5.25" drive bays, Twelve slots, "snap-in" drive rails, 8 cooling fans, Dims: (DxWxH) 20.5"x16.25"x23.75" $910

RAID Drive Enclosure KS-1000 w/Dual Redundant Hot-Swappable 300Wx2 PS, 10 Half-Height 5.25" or 5 FH 5.25" Front Access Drive Bays, 2 Blow-out Fans, Heavy-Duty All-Steel construction Dims: 19.5" x 10" x 24" (DxWxH) $699

Kingston DataSilo Steel 9-Bay Tower- world's most rugged & reliable drive enclosure, 9 half-height, 300W load sharing hot swappable Pwr-supplies(2), hot-swappable fans, with UW-SCSI connections(mf#DS500-S9TW) $1189

Kingston DataExpress Steel Enclosures for half-height bays for DataSilo Enclosure (mf#DE100I-SW) $159

Deluxe External SCSI Case w/Terminator+SCSI Cable+P/S+Fan 3.5" Half Height/5.25" Half Height ..... $60/$90

Deluxe External SCSI Case w/68Pin Wide/Ultra Wide SCSI Connector + P/S + Fan 3.5" Half Height with 68Pin External Cable and Terminator $150

CD-ROM Drive:

Artec Ultra-DMA 36X Speed Internal ATAPI IDE CD ROM $55

Toshiba XM-6102B 24X Speed Internal ATAPI IDE CD ROM $60

Toshiba XM-6202B 32X Speed Internal ATAPI IDE CD ROM $70

Mitsumi 32X VariableSpeed Internal ATAPI IDE CD-ROM $65

Toshiba XM-6201B 32X Speed Internal SCSI CD ROM $95

Plextor UltraPlex 14/32XSpeed, 2100-4800Kb/sec, Fast SCSI2, 95ms seek, 512K Buffer, SCAM, w/Tray, PX-32TSI internal $185

Mitsumi CD-Recorder 2X Write/8X read IDE $285

Hitachi 2X DVD ROM Drive - Bare drive IDE interface $140

Creative Labs DVD-ROM - 20xCDROM Dxr2 DVD bare IDE drive $140

Creative Labs Encore PC-DVD Encore Dxr2 Kit - 20xCDROM Dxr2 DVD, PCI Decoder, TV out, Dolby Digital Ready $215

Sound Card/Speaker/MultiMedia Package:

Yamaha, Altec Lansing, Bose, Sony Speakers ..... $Call

100W/180W/240W(P.M.P.O.) Hi-Fi Amplified Stereo Speakers $15/25/40

3D Stereo Sound Card w/ Wavetable, Full Duplex, 16Bit $20

ESS Maestro 1 PCI Sound Card $25

Sound Blaster AWE64 PnP Value OEM $70

Sound Blaster AWE64 GOLD PnP w/ IDE interface Retail $169

Sound Blaster 64 PCI Voice Full-Duplex $99

HardDisk:

Maxtor - DiamondMax 2160

4.3GB ULTRA DMA IDE 84320D4 <9.7ms, 33.3Mb/s 256KB, 5200RPM $160

6.4GB ULTRA DMA IDE 86480D6 <9.7ms, 33.3Mb/s 256KB, 5200RPM $195

8.4GB ULTRA DMA IDE 88400D8 <9.7ms, 33.3Mb/s 256KB, 5200RPM $265

11.5GB ULTRA DMA IDE 91152D8 <9.7ms, 33.3Mb/s 256KB, 5200RPM $360

SamSung - VG series

4.3GB ULTRA DMA IDE VG34323A 512KB, 5400RPM, 10ms, SMART $140

6.4GB ULTRA DMA IDE VG36483A 512KB, 5400RPM, 10ms, SMART $180

Western Digital - Caviar

2.5GB IDE WDAC22500 - UltraDMA 33.3Mb/s 256KB 9.5ms 5400RPM $135

3.2GB IDE WDAC23200 - UltraDMA 33.3Mb/s 256KB 9.5ms 5400RPM $148

4.3GB IDE WDAC34300 - UltraDMA 33.3Mb/s 256KB 9.5ms 5400RPM $169

6.4GB IDE WDAC36400 - UltraDMA 33.3Mb/s 256KB 9.5ms 5400RPM $215

8.4GB IDE WDAC38400 - UltraDMA 33.3Mb/s 256KB 9.5ms 5400RPM $290

2.1GB UltraWide SCSI-2 Enterprise E2170-7 512KB 7200RPM $299

4.3GB UltraWide SCSI-2 Enterprise E4360-7 512KB 7200RPM $419

9.1GB UltraWide SCSI-2 Enterprise E9100-7 512KB 7200RPM $689

Quantum

2.1GB FireBall SE32100A EIDE UltraDMA 9.5ms, 5400RPM $127

3.2GB FireBall SE33200A EIDE UltraDMA 9.5ms, 5400RPM $142

4.3GB FireBall SE34300A EIDE UltraDMA 9.5ms, 5400RPM $166

6.4GB FireBall SE36400A EIDE UltraDMA 9.5ms, 5400RPM $235

8.4GB FireBall SE38400A EIDE UltraDMA 9.5ms, 5400RPM $292

2.1GB FireBall SE32100S Ultra-SCSI 9.5ms, 5400RPM $199

3.2GB FireBall SE33200S Ultra-SCSI 9.5ms, 5400RPM $240

4.3GB FireBall SE34300S Ultra-SCSI 9.5ms, 5400RPM $290

6.5GB FireBall SE36400S Ultra-SCSI 9.5ms, 5400RPM $330

8.4GB FireBall SE38400S Ultra-SCSI 9.5ms, 5400RPM $469

Seagate

4.55GB Barracuda 4XL ST34572N Ultra SCSI-2 50pin 7200RPM, 512K $535

4.55GB Barracuda 4XL ST34572W UWide SCSI-2 68pin 7200RPM, 512K .. $495

9.1GB Barracuda9 ST19173N Ultra SCSI-2 50pin 7200RPM, 512K $689

9.1GB Barracuda9 ST19173W UWide SCSI 68pin 7200RPM, 512K $689

4.55GB Cheetah AV ST34501N Ultra SCSI-2 8.5MS, 10000RPM $550

4.55GB Cheetah AV ST34501W UWide SCSI 68pin 7.5MS, 10000RPM $580

9.1GB Cheetah AV ST19101N Ultra SCSI-2 7.5MS, 10000RPM $820

9.1GB Cheetah AV ST19101W UWide SCSI 7.5MS, 10000RPM $880

18.2GB Barracuda ST118273N Ultra SCSI-2 50pin 7200RPM, 512K $1250

9.1GB Barracuda9 ST118273W UWide SCSI 68pin 7200RPM, 512K $1250

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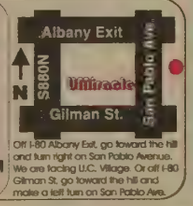

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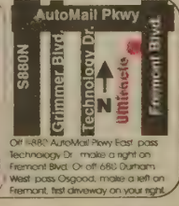

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Wireless T1

continued from page 118

You're starting to offer service in Oakland. How is that being done?

We've run a DS3, or a big pipe, going up to Oakland. We've secured one of the tall buildings in downtown Oakland, and now we're in the process of actually bringing the bandwidth up, wiring it up to the roof so we can beam from the rooftop. Already we've gotten requests from Emeryville and a lot of places in Oakland where they can't receive wired T1 service.

We would like to offer entire-Bay-Area coverage. With our existing infrastructure, anybody who's an ISP end-user all the way up to a T1 user is a potential customer for us, even with other technologies like XDSL and ADSL on the horizon. Just the other day I got an email from somebody about ADSL, saying that it only operates within three miles outside of their Central Office, so they still need a solution.

If you're in the wrong place, you just can't get it.

Exactly. Even though there's cable modem and ADSL, and that's fine, there are still a lot of holes in the infrastructure. So there's going to be room for wireless.

The way it's evolving now is that a lot of ISPs have contacted us about partnering opportunities. What we're trying to look at now is how we can bring other ISPs under this umbrella—how do we franchise it? How do we allow other ISPs to add this as part of their value-added package, and how to package this all together? Right now I'm talking to a number of ISPs about that very concept.

People have been working with this technology for some time, but why is it suddenly ready for prime time?

The reason I believe it's ready for prime time is that, especially for us in the downtown area, it's a solution that's quick. They can call us up, we put an antenna in their window, and they're up within a day. They're paying half the cost, they don't have to get in that Pac Bell queue and wait months and go through that whole process.

If you're in a 10-15 person office and everybody's accessing the Internet, you'll truly be impressed by the speed versus your regular dialup connection. These are people who are used to surfing the Internet, tired of slow speeds—they want to get on, get the information, and get off, and they're looking for much faster access.

So I think the big issues are the time savings of getting them up, the cost savings—and the fact that it works! ◆

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Wired Vs. Wireless—Comparative Cost Analysis

(Source: Innetix—other providers' rates vary, but comparable savings prevail)

	Wired	Wireless
Installation		
Phone company	$1267	—
ISP	$2500	$2500
CSU/DSU	$500	—
Router	$1200	—
Radio	—	$795
Antenna	—	$395
Total Installation Cost	**$5467**	**$3690**
Monthly Charge		
Phone company	$480	—
ISP	$900	$850
Total Monthly Cost	**$1380**	**$850**
Time to Install	**4–8 weeks**	**5–10 days**

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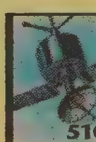
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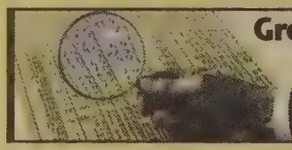

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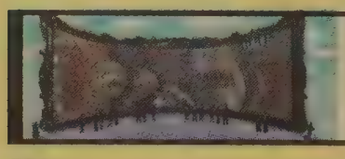

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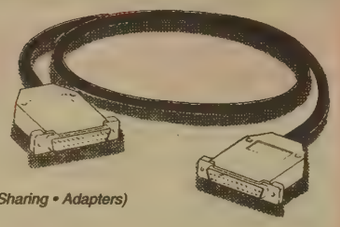

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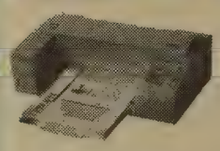

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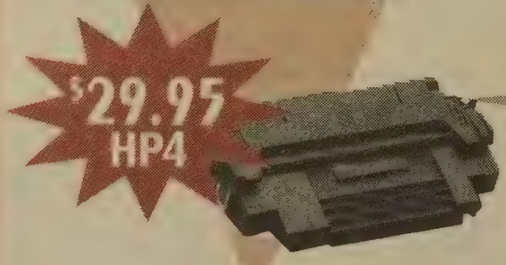

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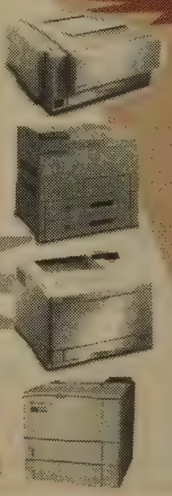

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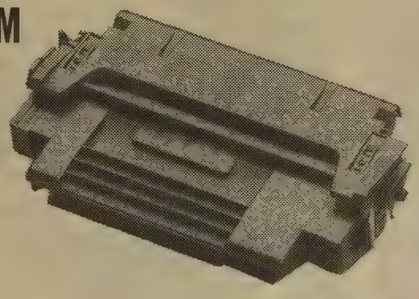

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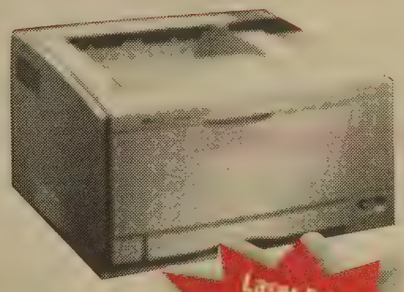

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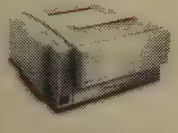

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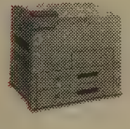

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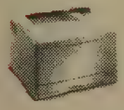

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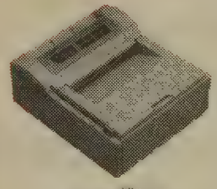

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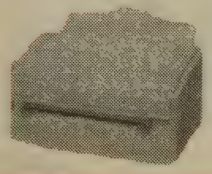

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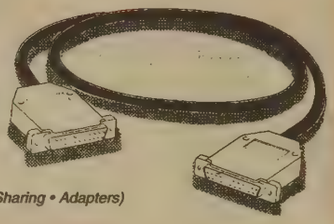

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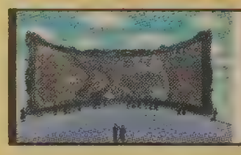

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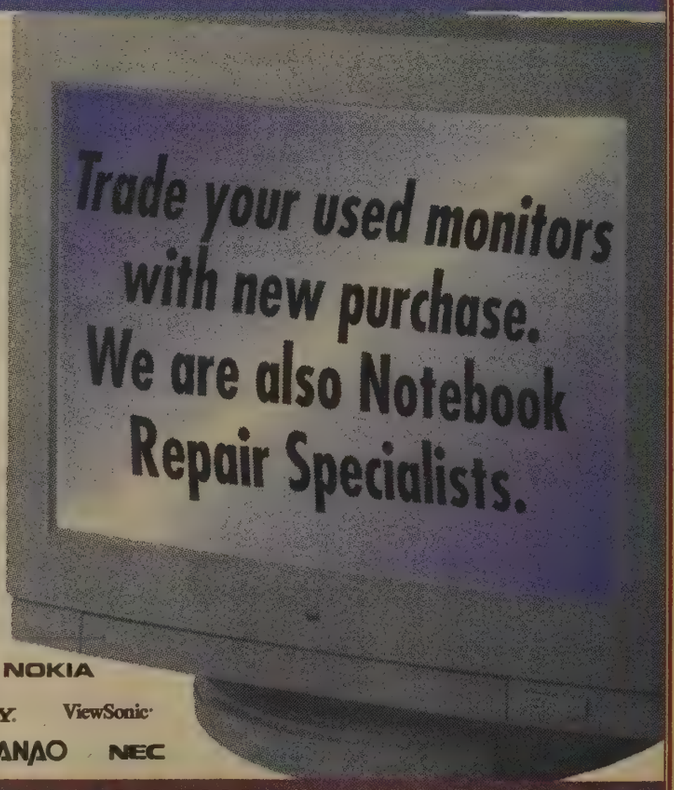

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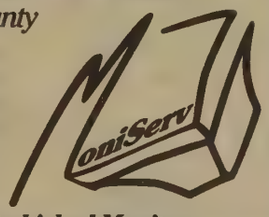

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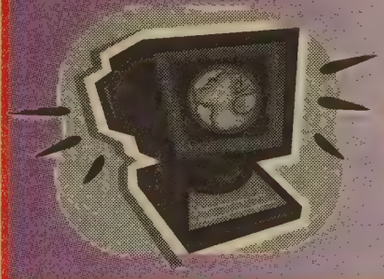

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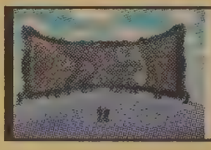

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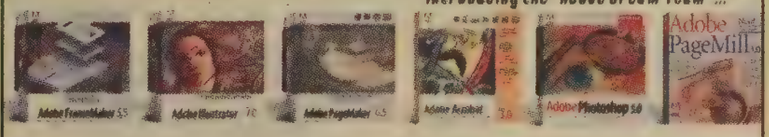

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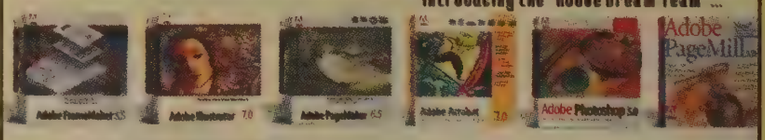

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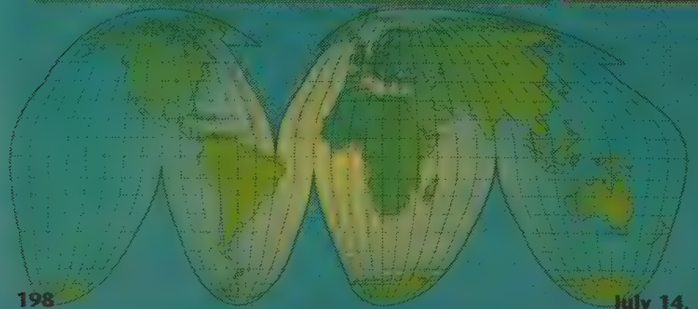

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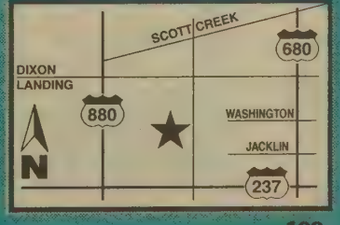

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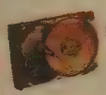

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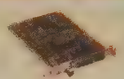

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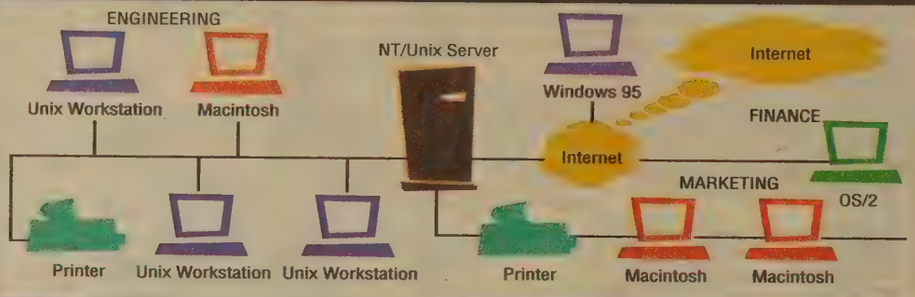

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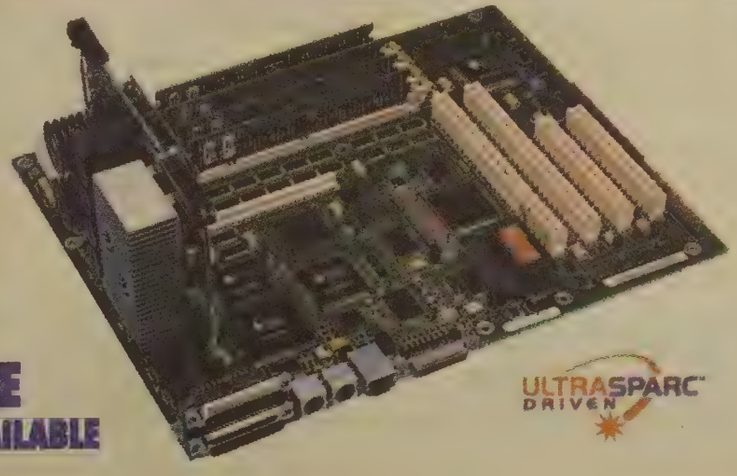

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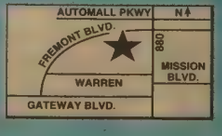

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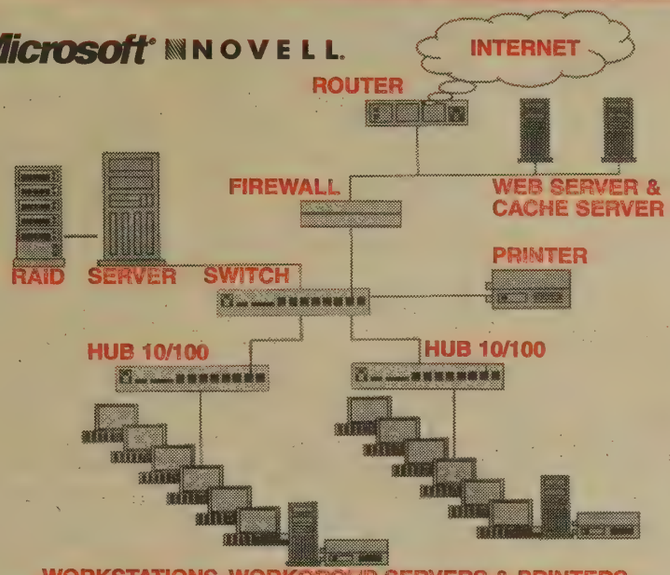

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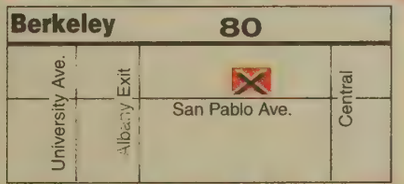

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Nothing Is Ever Serious Until The Jokes Appear

Or, The End Of The World As We Know It

By John C. Dvorak

As we approach the Year 2000 we can expect more and more attention to be paid to the problems that may occur. So in my joke in-box came this cute ditty from the Internet.

The Top 10 Unforeseen Consequences of the "Millennium Bug"

10. "99 Bottles of Beer on the Wall" song gets stuck in infinite loop.

9. At the stroke of midnight, Windows 99 turns back into DOS 1.0, the Pentium V turns back into an 8088, and the Handsome User is left holding a beautiful glass mouse.

8. Internet Movie Database now lists "1901: A Space Odyssey."

7. Bob Dole's age erroneously listed with only 2 digits.

6. Sales of Coca Cola jump drastically after original cocaine-laden formula becomes legal again.

5. Software engineers point out that since computers think it's almost 1900, we technically have to "party like it's 1899," which, frankly, doesn't seem like much fun.

4. Microsoft declares the year 1900 to be the new standard of the "Gatesian" calendar.

3. Jesus shows up late for His second coming, blames it on COBOL programmers.

2. Using a computerized adoption service, Michael Jackson mistakenly takes home some octogenarians.

and the Number 1 Unforeseen Consequence of the "Millennium Bug"...

1. Unexpected demand for COBOL programmers results in severe understaffing of McDonald's restaurants.

Personally I've never liked the reverse top ten lists, since they're a David Letterman invention and he's hard to top with this kind of thing. But over the past few years the Net has seen several such lists that reflect computer users' anguish—and are also funny. Three Top 10 lists I've collected recently that prove this point.

The Top Ten Ways Things Would Be Different If Microsoft Built Cars

10. A Particular model year of car wouldn't be available until *after* that year, instead of before.

9. Every time they repainted the lines on the road, you'd have to buy a new car.

8. Occasionally your car would just die for no reason, and you'd have to restart it. For some strange reason, you would just accept this.

7. You could only have one person at a time in your car, unless you bought a car '95 or a car NT, but then you would have to buy more seats.

6. You would be constantly pressured to upgrade your car. Wait a second, it's that way *now*!

5. Sun Microsystems would make a car that was solar powered, twice as reliable, five times as fast—but only ran on 5% of the roads.

4. The oil, alternator, gas, and engine warning lights would be replaced with a single "General Car Fault" warning light.

3. People would get excited about the new features in Microsoft cars, forgetting completely that they had been available in other brands for years.

2. We'd all have to switch to Microsoft Gas™.

1. Ford, General Motors, and Chrysler would all be complaining because Microsoft was putting radios in all its models.

> If Microsoft made cars, Ford, General Motors, and Chrysler would all be complaining because Microsoft was putting radios in all its models.

The Top Ten Reasons Computers Must Be Male

10. They have a lot of data but are still clueless.

9. A better model is always just around the corner.

8. They look nice and shiny until you bring them home.

7. It is always necessary to have a backup.

6. They'll do whatever you say if you push the right buttons.

5. The best part of having either one is the games you can play.

4. In order to get their attention, you have to turn them on.

3. The lights are on but nobody's home.

2. Big power surges knock them out for the night.

1. Size does matter!

The Top Ten Reasons Computers Must Be Female

10. Picky, picky, picky.

9. They hear what you say, but not what you mean.

8. Beauty is only shell deep.

7. When you ask what's wrong, they say "nothing."

6. Can produce incorrect results with alarming speed.

5. Always turning simple statements into big productions.

4. Smalltalk is important.

3. You do the same thing for years, and suddenly it's wrong.

2. They make you take the garbage out.

1. Miss a period and they go wild!!! ◆

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Umiracle, Fremont, CA (510) 226-6791
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Westwood Computer, (310) 271-8188
EZ Computer, 12 Southern California locations, (888) 928-2326
Nexcom, 4 Southern California locations, (714) 258-0800
Insight Direct (800) INSIGHT

	CRT monitor Model/ Viewable Area	TCO	Dot Pitch/ CRT Type	Max. Horizontal Scan Rate	Max. Resolution	Est. Street Price
21"	VisionMaster Pro 502 (19.5" VIS)	TCO '95	0.28mm/AG	110khz	1800 x 1440@74hz	$1,059
	VisionMaster Pro 501 (19.5" VIS)	TCO '95	0.28mm/AG	96khz	1600 x 1200@75hz	$999
	VisionMaster 502 (19.5" VIS)	TCO '95	0.27mm/dp	110khz	1800 x 1440@74hz	$1,059
	VisionMaster 501 (19.5" VIS)	TCO '95	0.27mm/dp	96khz	1600 x 1200@75hz	$999
19"	VisionMaster 450 (18.0" VIS)	TCO '95	0.26mm/dp	102khz	1600 x 1200@80hz	$699
17"	VisionMaster Pro 400 (16.0" VIS)	TCO '95	0.25mm/AG	96khz	1600 x 1200@75hz	$529
	VisionMaster 400 (16.0" VIS)	TCO '95	0.26mm/dp	96khz	1600 x 1200@75hz	$489
15"	VisionMaster 350 (13.7" VIS)	MPR-II	0.28mm/dp	69khz	1280 x 1024@65hz	$248

	TFT/LCD monitor Model	TCO	Pixel Pitch	Max. Horizontal Scan Rate	Max. Resolution	Est. Street Price
14.1"	Pro Lite 36	TCO '95	0.279mm	62.5khz	1024 x 768@75hz	$998
15"	Pro Lite 38a	TCO '95	0.279mm	62.5khz	1024 x 768@75hz	$1,498
	Pro Lite 38b (with USB & Speaker)	TCO '95	0.279mm	62.5khz	1024 x 768@75hz	$1,698

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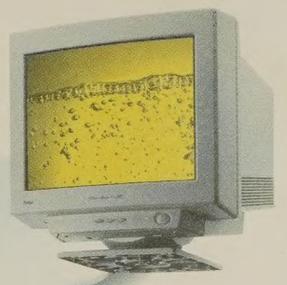

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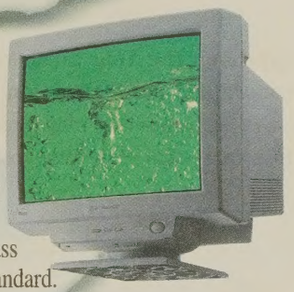

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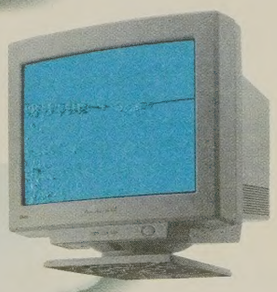

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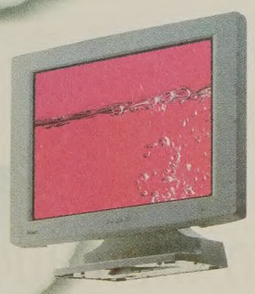

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